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A semantically enriched taxonomic revision of *Gryonoides* Dodd, 1920 (Hymenoptera, Scelionidae), with a review of the hosts of Teleasinae

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Abstract

Teleasinae are commonly collected scelionids that are the only known egg parasitoids of carabid beetles and therefore play a crucial role in shaping carabid populations in natural and agricultural ecosystems. We review the available host information of Teleasinae, report a new host record, and revise *Gryonoides* Dodd, 1920, a morphologically distinct teleasine genus. We review the generic concept of *Gryonoides* and provide diagnoses and descriptions of thirteen *Gryonoides* species and two varieties: *G. glabriceps* Dodd, 1920, *G. pulchellus* Dodd, 1920 (= *G. doddi* Ogloblin, 1967, **syn. nov.** and *G. pulchricornis* Ogloblin, 1967, **syn. nov.**), *G. brasiliensis* Masner & Mikó, **sp. nov.**, *G. flaviclavus* Masner & Mikó, **sp. nov.**, *G. fuscoclavatus* Masner & Mikó, **sp. nov.**, *G. garciai* Masner & Mikó, **sp. nov.**, *G. mexicali* Masner & Mikó, **sp. nov.**, *G. mirabilicornis* Masner & Mikó, **sp. nov.**, *G. obtusus* Masner & Mikó, **sp. nov.**, *G. paraguayensis* Masner & Mikó, **sp. nov.**, *G. rugosus* Masner & Mikó, **sp. nov.**, *G. uruguayensis* Masner & Mikó, **sp. nov.** We treat *Gryonoides scutellaris* Dodd, 1920, as status uncertain. *Gryonoides mirabilicornis* Masner & Mikó, **sp. nov.** is the only known teleasine with tyloids on two consecutive flagellomeres, a well-known trait of

Sparasionidae. An illustrated identification key to species of *Gryonoides*, a queryable semantic representation of species descriptions using PhenoScript, and a simple approach for making Darwin Core Archive files in taxonomic revisions accessible are provided.

Keywords
Egg parasitoids, Carabidae, South America, color pattern evolution, biomedical anatomy ontology, ovipositor, Darwin Core Archive

Introduction

Egg parasitoids are the most important egg mortality factors in insects (Fatouros et al. 2020). Members of the subfamily Teleasinae are the only known egg parasitoids of ground beetles (Coleoptera, Carabidae), and ground beetles and rove beetles are the only known hosts for Teleasinae (Table 1). Besides Teleasinae, there was only one prior report of a carabid egg parasitoid, *Ooencyrtus alboantennatus* (Subba Rao, 1971) (Chalcidoidea, Encyrtidae) (Subba Rao 1971). A label of the holotype specimen states that it was reared from the eggs of *Nothopeus hemipterus* Olivier, a well-known cerambycid pest of the clove tree, *Syzygium aromaticum* (L.) Merr. and L. M. Perry (Myrtaceae) (Franssen 1937). However, in his original publication, Subba Rao (1971) reported the host of his new species as *Nothopus* Leconte (Coleoptera: Carabidae) instead of *Nothopeus* Pascoe, an error in the transcription of the label data.

Carabid species play an important role in natural and agricultural ecosystems. Understanding their population dynamics and mortality factors are thus essential for developing sustainable ecosystem management programs (Lövei and Sunderland 1996; Kromp 1999; El-Danasoury and Iglesias-Piñeiro 2018). Teleasinae are common in yellow pan traps (Mikó 2016), screen sweeping, sifted litter, and pitfall trap samples, even in disturbed habitats. However, their abundance in the environment does not correlate to knowledge of their biology.

Collecting small carabid eggs can be challenging as many of the species lay their eggs enclosed in mud cells, below the soil surface, in clusters of potential prey eggs, or inside prey nests (Claassen 1919; Brandmayr and Brandmayr 1979; Bin 1983; Moore and Di Giulio 2019).

Teleasinae are the only scelionid subfamily that is not represented in the fossil record. Nel and Azar (2005) classified a fossil specimen from the early Cretacous in Teleasinae and erected a new genus, *Cretaxenomerus* Nel & Azar, 2005, as the oldest platygastroid fossil from Lebanese amber. The authors exclusively used the identification key and the brief description of Teleasinae from Goulet and Huber, 1993, to classify the new fossil in Platygastroidea, Scelionidae and Teleasinae. This approach lacks taxonomic rigor and unfortunately has been widely applied in paleoentomology (Mikó et al. 2018). The line drawing provided by Nel and Azar (2005) does not depict a teleasine, and we consider very unlikely that it is a platygastroid. Proper placement of this taxon will require reexamination of the holotype specimen.

Phylogenetic analyses (Austin and Field 1997; Murphy et al. 2007; Popovici et al. 2017; Chen et al. 2021) consistently retrieve Teleasinae as monophyletic and the sub-

Table 1. Species of Teleasinae with known hosts.

Parasitoid species	Host species	Reference
Teleas rugosus Kieffer, 1908	*Zabrus tenebrioides*, *Harpalus* sp. (Carabidae)	Telenga 1959, Egorova 1967, Plastin and Kononova 1991
Teleas lamellatus Szabó, 1956	*Zabrus tenebrioides* Goeze, 1777 (Carabidae)	Mikó et al. 2005
Teleas rugosus Kieffer, 1908	*Harpalus* sp. (Carabidae)	Telenga 1959
Teleas sp.	*Harpalus* sp. (Carabidae)	Telenga 1959
Teleas rugosus Kieffer, 1908	*Amara* sp. (Carabidae)	Telenga 1959
Xenomerus canariensis Huggert, 1979	*Dromius* sp. (Carabidae)	Bin 1983
Trimorus caraborum (Riley, 1893)	*Chlaenius impunctifrons* Say, 1823 (Carabidae)	Ashmead 1893
Trimorus mandibularis (Ashmead, 1887)	*Harpalus rufipes* (Degeer, 1774) (Carabidae)	present paper
Xenomerus orientalis Mikó & Masner, 2010	*Parena nigrolineata* (Chaudoir, 1852) (Carabidae)	Mikó et al. 2010
Trimorus fulvimanus Kieffer	*Acylophorus wagenshieberi* Kiesenwetter, 1850 (Staphylinidae)	Staniec 2005

family has clear morphological limits (Masner 1976, 1980, 1993). However, most of its constituent genera are not well-defined and require revision at the genus and species levels. The subfamily can be recognized by the long marginal vein of the fore wing (3–4 times the length of the stigmal vein), metasomal tergite 3 as the longest and widest, and the presence of acrosternal calyces. Although each of these characters can be found in other scelionids (Mikó et al. 2010), this combination is unique to Teleasinae.

Gryonoides is one of the few teleasine genera with well-defined morphological limits. The genus was erected by Dodd (1920) based on the presence of lateral spines on the mesoscutellum. Although a few other teleasines also possess lateral mesoscutellar spines (e.g. *Dvivarnus*), *Gryonoides* can be readily diagnosed from them via multiple characters (Talamas et al. 2016) including the extremely elongate male flagellomeres. *Gryonoides* is strictly Neotropical in distribution and although rarely represented in historic collections (e.g. only 15 specimens can be found in the Hymenoptera holdings of the United States National Museum), a significant number of specimens have been are present in the Canadian National Collection of Insects, Arachnids and Nematodes. Lubomír Masner has participated in more than 50 collecting trips to the Neotropics and gleaned specimens of *Gryonoides* from the collecting efforts of many colleagues (Johnson 2009). The 1,126 specimens of *Gryonoides* amassed at CNC represent the bulk of the specimens used in this treatment.

Recently it has come to our attention that substantial holdings of *Gryonoides* exist in smaller collections. For example, over 400 specimens are deposited at the C. A. Triplehorn Insect Collection at The Ohio State University, USA (https://mbd-db.osu.edu/) and over 1,400 specimens are housed in the Museo del Instituto de Zoología Agrícola "Francisco Fernández Yepez" (García and Montilla 2004).

Materials and methods

Specimens

This revision is based on specimens housed in the following collections: BMNH (The Natural History Museum, London, United Kingdom), CNC (Canadian Nation-

al Collection of Insects, Ottawa, ON, Canada), FSCA (Florida State Collection of Arthropods, Gainesville, FL, USA), USNM (National Museum of Natural History, Washington, DC, USA), UFES (Universidade Federal do Espirito Santo, Departamento de Biologia, Colecão Entomologica, Vitória, Brazil), MLP (Museo de La Plata, Universidad Nacional de La Plata, La Plata, Argentina). Specimen occurrence data are made available through a Darwin Core Archive (Wieczorek et al. 2012) published on GitHub (https://github.com/seltmann/taxonomy-darwin-core) using. Occurrence Core following the recent GitHub Approach to Publishing Darwin Core Formatted Occurrence Data for Taxonomic Studies (Appendix 1. Seltmann et al. 2021).

Microscopy

Morphological phenotypes were examined with an Olympus SZX16 stereo-microscope, with an Olympus SDF PLAPO 2× PFC objective (230×). Brightfield images of pinned specimens were taken with an Olympus BX43 compound microscope equipped with an Olympus DP72 digital camera. Extended-focus images were rendered with Zerene Stacker (Version 1.04 Build T201404082055; Zerene Systems LLC, Richland, WA), annotated, and modified with Adobe Photoshop 6 (Adobe Systems, San Jose, CA) using the Adjust/Filter/Unsharp mask and Image/Adjustments/Exposure (Gamma correction) tools. Metasomata were removed from the specimens and placed in 20% KOH for 24 hours, rinsed in 20% acetic acid for 30 minutes then transferred to a glycerin droplet on a concavity slide (Sail Brand Ltd., West Yorkshire, United Kingdom) and dissected. Sample preparation and imaging with confocal laser scanning microscopy followed Mikó et al. (2016). Ovipositors were mounted between two coverslips (1.5 µm, 22 × 60) in a glycerin droplet, using Blu-tack (Bostik, Wauwatosa, WI) as a spacer. Specimens were imaged with an Olympus FV10i desktop CLSM using a 60× objective.

Terminology, natural language (NL) descriptions

Morphological terms largely follow Mikó et al. (2007) and were matched to the Hymenoptera Anatomy Ontology (HAO) (Yoder et al. 2010) using the HAO portal (http://portal.hymao.org/projects/32/public/ontology/). The medial area of the lateral propodeal area (malp) is delimited laterally by a longitudinal carina (car1) that is medial to and parallel with the plica (plica) and delimited ventromedially by the L-shaped lateral propodeal carina (lpc: Fig. 22). The malp can be either glabrous or setose and is usually divided by a longitudinal carina (car2) that is incomplete in most *Gryonoides* species (Fig. 22). Taxonomic treatments including NL phenotype representations were compiled in mx (http://purl.org/NET/mx-database). Terminology of the phenotype statements used in descriptions are mapped to the HAO (available at http://purl.obolibrary.org/obo/hao.owl), Phenotypic Quality Ontology (PATO, available at http://purl.obolibrary.org/obo/pato.owl), Biospatial Ontology (BSPO, available at http://purl.obolibrary.org/obo/bspo.owl), and Common Anatomy Reference Ontology (CARO, available at http://obofoundry.org/). NL phenotype representations are

in 'entity attribute: value' format. Taxonomic nomenclature, specimen data, supporting images, OTU concepts, and NL phenotypes were compiled in mx (http://purl.org/NET/mx-database). Taxonomic histories, descriptions, and material examined sections were also produced with this software. The semantic phenotype statements were created using PhenoScript (https://github.com/sergeitarasov/PhenoScript/wiki) that is a language for semantic description of phenotypes using instance-based approach; its grammar, inspired by the graph description language DOT (https://en.wikipedia.org/wiki/DOT_(graph_description_language)), enables fast creation of semantically rich statements that can be directly imported into Web Ontology Language (OWL) using the PhenoScript compiler (https://github.com/sergeitarasov/PhenoScript/blob/master/Examples/Gryonoides/Workflow.R). The PhenoScript descriptions (Suppl. saterial 2) were generated using Atom (https://atom.io/) that help using controlled vocabularies, built from ontology terms, through respective snippets. PhenoScript descriptions, output ontologies and supporting scripts are available from https://doi.org/10.5281/zenodo.5768770. The instance-based approach of PhenoScript is similar to the class-based one using Manchester Syntax (http://www.w3.org/TR/owl2-man-chester-syntax/). The difference between the two is that the first creates ABox expressions, while the second one TBox expressions. The ABox expressions (i.e., instance-based ones) are easier to write and interpret. The protocols for semantic phenotype annotation follow Balhoff et al. (2013), Mikó et al. (2014). For more formal rdf representations of hymenopteran phenotypes see https://github.com/hymao/hymao-data. Distribution maps were generated using QGIS software (QGIS Development Team 2021).

Rearing experiment

Eggs of *Harpalus rufipes* (Degeer, 1774) were collected during September 2016, in Boalsburg, PA, USA, by uprooting young shoots of *Digitaria* Haller (crabgrass) from gravel in the backyard of a suburban home. Females of *H. rufipes* and their freshly laid eggs were exposed when the plants were pulled out. The eggs were placed on wet filter paper in sterilized petri dishes and kept at 20 °C for two weeks. Following this period, the two initially brown eggs were dissected in 0.1 M phosphate buffer. Eggs and emerging larvae were fixed with 75% ethanol and transferred into a glycerol droplet on concave microscope slides. The reared specimens of *Trimorus mandibularis* (Ashmead) were identified by comparison with images of the holotype (USNMENT01059227) provided by Talamas et al. (2016).

Results and discussion

New host record

Trimorus mandibularis were reared from the eggs of *Harpalus rufipes*. Of the 37 eggs, two were light brown and the rest were white at the time of collection. During egg

collection, we observed 10–30 *H. rufipes* females with enlarged abdomens digging in the substrate (gravel densely overgrown by crabgrass). Eye spots and mandibles appeared through the chorion in white eggs 2–3 days after collection, indicating that the eggs were freshly laid. These structures did not appear on the two light brown eggs (Suppl. material 1: Fig. 1) indicating that the development of the embryos inside the eggs was terminated. One week after the egg collection, carabid larvae started to emerge from the white eggs, while the chorion of the two light brown eggs gradually darkened and became less transparent. After 2 weeks, carabid larvae from all white eggs hatched and the chorions of the two initially light brown eggs became harder and opaque. At the end of the second week we dissected two pharate adults of *T. mandibularis* from the parasitized, originally light brown eggs. *Trimorus mandibularis* is most similar to *T. arenicola* (Thomson 1859) (holotype examined by István Mikó), a Palearctic species. Both possess rugulose sculpture on the lateral portions of the mesonotum and the medial region of T3, have spines along the lateral surface of the mesotibia, and have the clypeus more than 2 times as wide as long. Many, but not all, specimens of *T. mandibularis* have rugae radiating posteriorly from the medial portion of the anterior margin of the mesoscutellum. Whether *T. arenicola* and *T. mandibularis* represent two distinct species or are synonyms require further analysis. Some of the characters of *T. mandibularis* are shared with *Teleas* (enlarged mandibles, spines on the mesotibia) and were hypothesized to help females dig while searching for host eggs (Sharkey 1981). Our observation supports this hypothesis as *H. rufipes* females lay their eggs 2–3 cm under the soil surface, requiring females of *T. mandibularis* to dig to reach the eggs. The majority of teleasines, including *Gryonoides*, do not possess enlarged mandibles, spines on the mesotibia or rugulose sculpture on the mesosoma, suggesting that these insects do not dig in the soil. Although it is generally accepted that carabid beetles usually burrow their eggs in the soil, our knowledge on carabid egg laying behavior is limited, and based on some scattered information, the number of carabid species that lay their eggs above the soil surface may be substantial (Claassen 1919; Sasakawa 2017; Saska and Honek 2004).

Distribution

Gryonoides might be the most commonly collected teleasine genus in the Neotropical realm (García and Moontilla 2005). Despite extensive Neotropical sampling efforts in the last 50 years (Johnson 2009), *Gryonoides* specimens have not been recovered from the West Indies (Fig. 24). We do not know the host relationships for *Gryonoides*, but, based on their body size (1900–3125 μm), the eggs of its host species are predicted to be 3000–4000 μm. Eggs of this size range are laid by larger carabid species (Casale et al. 1996; Gilgado and Ortuño 2011; Moore and Di Giulio 2019). The carabid fauna of the West Indies is almost exclusively composed of winged and small to medium size species less than 24 mm long that colon ized the islands from mainland Mesoamerica (Darlington 1970). We suspect that the absence of larger carabids, which are the putative hosts of *Gryonoides*, is the reason for the absence of *Gryonoides* in the West Indies.

PhenoScript: from class-based to specimen-based semantic representations

In the following addenda we propose the transversion of natural language (NL) statements into PhenoScript, an instance-based OWL/XMLl syntax (Table 2). We also provide a brief comparison between some PhenoScript-based and Manchester Syntax-based semantic statements (Balhoff et al. 2012; Mikó et al. 2016). PhenoScript is generally simpler than Manchester Syntax, and since it is instance based it allows direct comparison between instances of anatomical structures within the same organism or between different organisms.

It provides simpler, less abstract, expressions that are better suited for data mining applications than multi-level nested Manchester Syntax expressions which are complicated and sometimes impossible to reformat into a queryable triplestore (for further advantages of an instance based approach over a class based approach see Vogt 2021).

Systematics of *Gryonoides*

Gryonoides Dodd, 1920

Gryonoides Dodd, 1920: 360 (original description. Type: *Gryonoides pulchellus* Dodd, by original designation), Dodd, 1930: 42 (keyed); Fouts, 1948: 92 (keyed); Muesebeck & Walkley, 1956: 356 (citation of type species); Masner, 1976: 70, 74 (description, keyed); Johnson, 1992: 513 (cataloged, catalog of world species); Austin

Table 2. Instance versus class based semantic representations of Hymenoptera phenotypes.

Statement Type	NL Statement	PhenoScript	Manchester Syntax
Compares relative positions of anatomical lines	Head triangular from anterior view (longest head width dorsal to horizontal midline of head)	head > anterior_side > maximum_ width dorsal_to. horizontal_plane < head;	'Has part' some (head and 'has part' some ('anterior side' and 'has part' some ('maximum width' and ('dorsal to' some (horizontal plane and ('bearer of' some centered) and ('inheres in' some head))))))
Describes connectedness of cuticular elements	Torular triangle open dorsally (left and right carinae not continuous dorsomedially)	torular_triangle > (carina1, carina2); carina1 >> left; carina2>> right; carina1 continuous_with. carina2	'Has part' some ('torular triangle' and 'has part' some (carina and ('bearer of' some left) and (continuous_with some (carina and 'bearer of' some right))))
Describes color shared by multiple anatomical structures	Interantennal prominence, mouthparts, antenna yellow	(interantennal_prominence, mouthparts, antenna) >> yellow;	'has part' some 'interantennal prominence' and 'bearer of' some yellow; 'has part' some mouthparts' and 'bearer of' some yellow; 'has part' some mouthparts and 'bearer of' some yellow;
Compares lengths of anatomical lines (morphometric indices)	Scape 4.5 times as long as wide	scape >> length is_quality_ measured_as. measurement_datum has_measurement_unit_label. length << radicle; measurement_datum has_measurement_value. 4.2;	'Has part' some (scape bearer_of some (length and is_quality_measured_as some ((has_measurement_ unit_label. length inheres_in. radicle) and (has_ measurement_value.(=4.0,=4. 5float))));
Expresses surface properties of cuticular regions (e.g. coloration, sculpture, pilosity)	Metanotal spine longer than striated proximal region on mesoscutellum	metanotal_spine >> length |>| length << proximal_region < mesoscutellum; proximal_region >> striated	'Has part' some ('metanotal spine' and 'bearer of' some (length and increased_in_magnitude_ relative_to some (length and inheres_in some (proximal region and ('part of' some mesoscutellum) and ('bearer of' some striated)))))

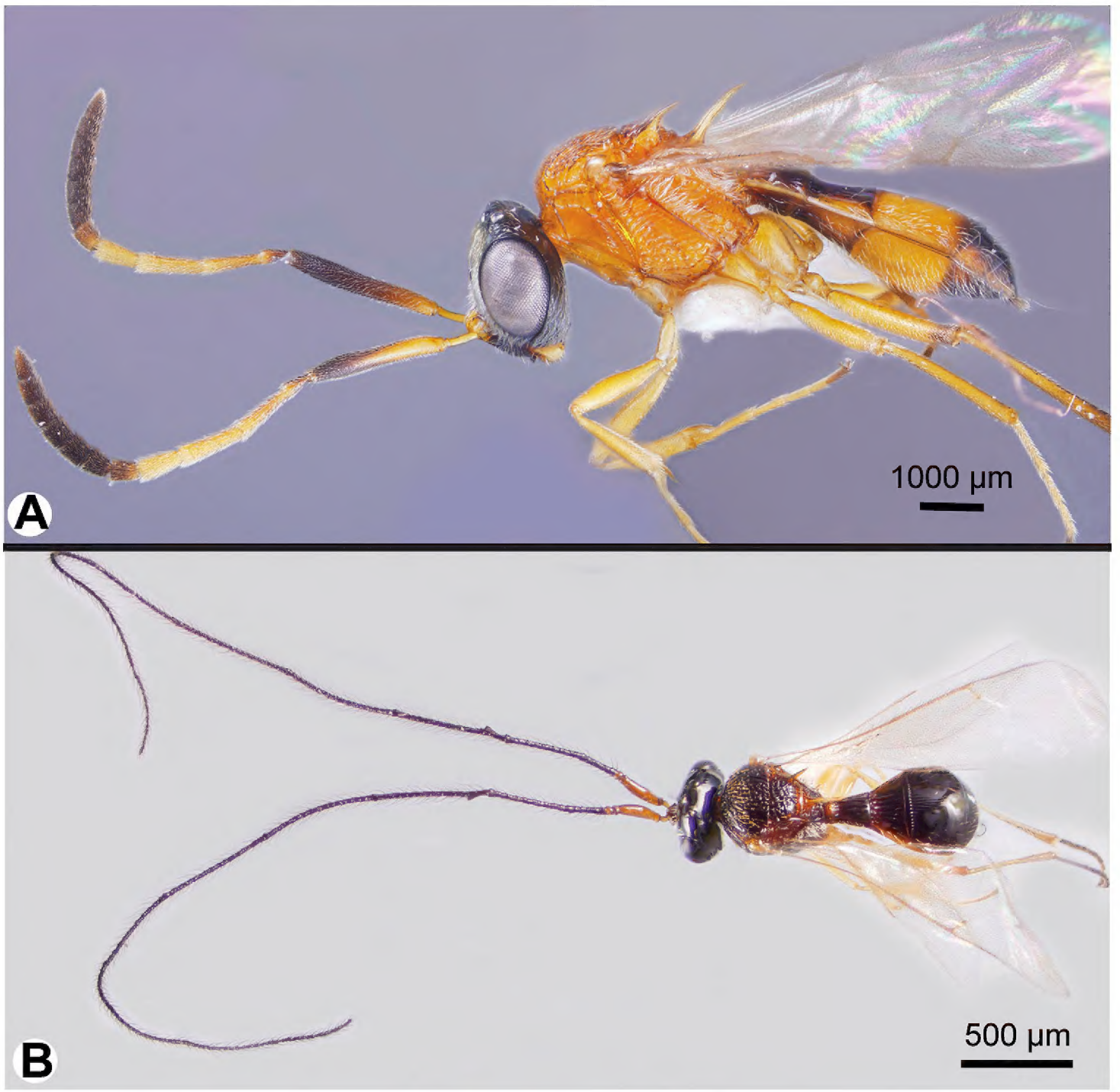

Figure 1. *Gryonoides* Dodd 1920, habitus **A** *Gryonoides pulchellus* var. *pulchellus* Dodd, 1920, female, lateral view (CNCHymen_132834) **B** *Gryonoides glabriceps* Dodd, 1920, male, dorsal view (CNCHymen_132133).

& Field, 1997: 46, 68 (structure of ovipositor system, discussion of phylogenetic relationships); Talamas, Mikó and Copeland 2016: 7 (keyed).

Diagnosis. *Gryonoides* was diagnosed from two other taxa with lateral mesoscutellar spines, *Dvivarnus* Rajmohana and Veenakumari and a species in the *Trimorus carus* group, by Talamas et al. (2016). The elongate clypeus and torular triangle of *Gryonoides* are shared with the undescribed species in the *T. carus* group, whereas the presence of the proximal projections of cercal plates (pac: Fig. 2A) is shared with *Dvivarnus* (Fig. 3A). Additional diagnostic characters can be found in the ovipositor assembly: *Gryonoides* differs from *Dvivarnus* and the *T. carus* species group in the presence of a resilin rich sclerotized bridge (based on its blue autofluorescence in

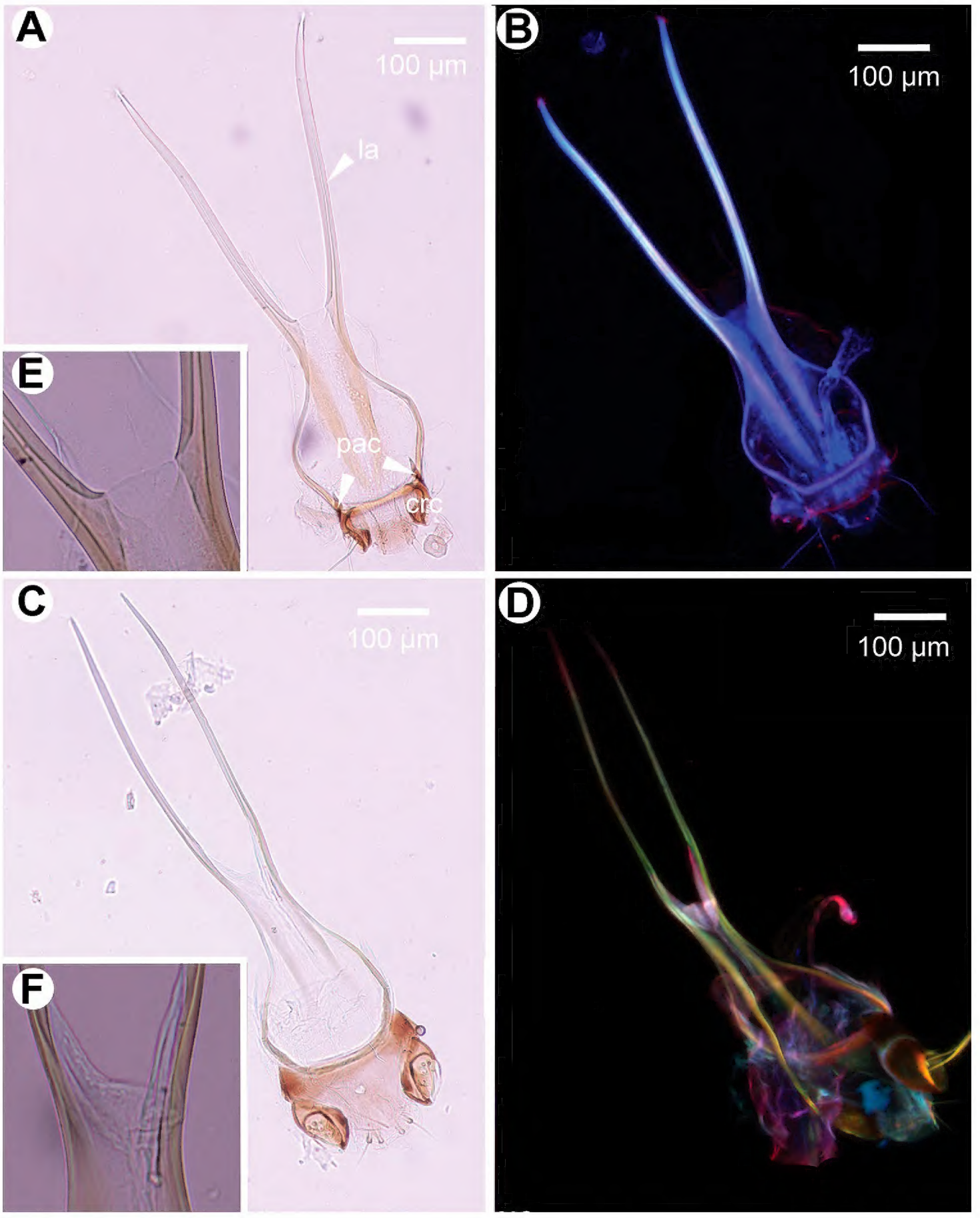

Figure 2. Ovipositor assembly of *Gryonoides* Dodd, 1920 **A** *Gryonoides glabriceps*, T7+8, (CNCHymen_132935) **B** *Gryonoides pulchellus* var. *doddi* Dodd, 1920, ovipositor assembly, (CNCHymen_132961). Sclerotised and resilin rich bridge is present in the ovipositor assembly of *Gryonoides* (crc = cercus, pac = proximal projections on cercal plate, la = lateral apodemes).

response to 405 nm excitation wavelength and strong red fluorescence in response to 488 nm laser) connecting the lateral arms of T7+8 (brg, la: Figs 2A, 2B). *Gryonoides* males and females exhibit a unique sexual dimorphism in the ratio of the length of

Figure 3. T7+8 of Teleasinae with lateral mesoscutellar spines **A, E, C, F** brightfield **B** and **D** CLSM images using 488 and 405 lasers with red, green and blue filters **A, B, F** *Dvivarnus agamades* (USNM_96246). **C, D, F** *Trimorus carus*-group (CNCHymen_133695). Proximal projections of cercal plates (pac) are present in *Dvivarnus* and *Gryonoides* and absent from *Trimorus* sp. Sclerotised and resilin rich bridges are absent from both taxa illustrated on this figure (la = lateral apodemes, crc = sercus).

the radicle and the scape. Whereas in other scelionid species, the ratio is the same in males and females, in *Gryonoides*, the female radicle is longer than that of the male relative to the length of the scape (Figs 1A, B). It should also be noted that *Gryo-*

noides has a strictly Neotropical distribution whereas other teleasines with lateral mesoscutellar spines are not known from this region.

Description. Shape of male flagellomeres 3–11: cylindrical. Visibility of frontal patch: obscured by facial striae. Erect whorl of setae on male flagellomeres: absent. Male antenna length: more than 4 times as long as the body length. Number of papillary sensilla on female A12: 1. Number of papillary sensilla on female A7: 0. Female radicle length: elongate (4–5.7 times as long as wide). Mandibular teeth: 3. Mandibular teeth length: dorsal tooth > ventral tooth > medial tooth. Genal patch: absent. Facial striae: present. Clypeus length versus mandible width: clypeus at least 3 times as long as the width of the mandible. Hyperoccipital carina: absent. Vertex patch: absent. Anterior process of pronotum structure: reduced. Epomial carina: present. Pronotal cervical sulcus: present. Pronotal suprahumeral sulcus: present. Pronotal cervical sulcus sculpture: smooth. Pronotal suprahumeral sulcus sculpture: foveolate. Pronotal suprahumeral sulcus versus pronotal cervical sulcus: Pronotal suprahumeral sulcus ends medially before reaching pronotal cervical sulcus. Netrion sulcus versus pronotal: netrion sulcus does not reach pronotal rim. Netrion sulcus: present. Netrion sculpture: foveolate. Netrion length: netrion exceeding 2/3rd of pronoto-mesopectal "suture". Posterior pronotal sulcus: present. Ventral propleural area: smooth. Propleural epicoxal sulcus sculpture: crenulate (scalloped). Subalar pit: present. Epicoxal sulcus sculpture: crenulate (scalloped). Fovea of the foveolate scutoscutellar sulcus diameter: diameter of fovea decreasing towards midline. Medial area of the anteromesoscutum sculpture: areolate. Notaulus anterior end: anterior to the transscutal line. Mesonotal humeral sulcus sculpture: crenulate. Mesonotal suprahumeral sulcus anteromedial end: extending to anterior ends of notauli. Mesonotal suprahumeral sulcus sculpture: crenulate (scalloped). Scutoscutellar sulcus sculpture: smooth medially, foveolate laterally. Scutoscutellar sulcus lateral end: reaching the axillula laterally. Mesoscutellum posterior margin in dorsal view: concave. Mesoscutellum medial spine: absent. Transaxillar carina: present. Posterior scutellar sulcus lateral end: reaching the axillula laterally. Posterior scutellar sulcus: present. Posterior scutellar sulcus sculpture: foveolate. Mesepisternum (area anteroventral to mesopleural depression) sculpture: areolate (irregular foveae around setal bases present). Mesopleural pit: present. Mesopleural carina: present. Postacetabular patch: absent. Acropleural sulcus length: elongate. Acropleural sulcus: present. Apical semi transparent lamella on the metanotal spine: absent. Metascutellum sculpture: striated proximally. Metanotal spine length: longer than proximal striated region of metascutellum. Metanotal trough sculpture: foveolate. Metanotal spine: present. Metanotal spine shape dorsal view: pointed. Metapleural pit: present. Metapleural sulcus sculpture: smooth. Metapleural sulcus: present. Ventral metapleural area sculpture: transverse carinae present. Central propodeal area pilosity: absent. Lateral propodeal carina: present. Lateral propodeal carina versus posterior propodeal projection: adjacent. Lateral propodeal carinae shape: inverted Y-shaped. Posterior propodeal projection: present. Hind wing largest width versus marginal ciliae length: hind wing is more than two times as wide as marginal cilia length. Dorsal margin of female T1 in lateral view shape: convex. Lateral setae on T1: 5 or more. Basal depressions of T1: present. Felt field: present. Lateral patch on T2: present. Basal depressions on T2: present. Basal depressions

on T3: present. Apical setae on T3 length: apical setae on T3 are not longer than non apical setae on T3. Posterodorsal patch on T3: present. Basal depression on S1: present. Posterior felt field in female: absent. Basal depression on S2: present. Basal grooves on S3: present. Acrosternal calyx: present. Acrosternal calyx shape: circular. Acrosternal calyces medially: separated. Medial extension of lateral apodemes (female): separated. Medial apodeme on S6 (female): present.

Identification key to *Gryonoides* species

Gryonoides females can be divided into two distinct species groups: the *G. glabriceps* species group and the *G. pulchellus* species group. Females of the *G. glabriceps* species group have a dorsally closed torular triangle that does not extend above the horizontal midline of the upper face (Figs 7A, 5A), and a largely black or dark brown mesoscutum, pronotum and mesopectus (Figs 10–14). This contrasts with the females of the *G. pulchellus* species group, which possess either a dorsally opened torular triangle or a closed triangle that extends above the horizontal midline of the upper face (Figs 7B, 8C) and are characterized by the yellowish-orange mesoscutum, pronotum and mesopectus (Figs 1A, 4–9, 27).

Although males of the two species groups cannot be separated by any combinations of traits, male specimens of each species belonging to the *G. glabriceps* species group can be confidently identified as they possess multiple diagnostic characters. Although we found diagnostic characters on male specimens for some *Gryonoides* species, matching males and female specimens should be further tested using molecular markers. We were not able to identify male specimens for *G. brasiliensis*, *G. flaviclavus*, *G. fuscoclavatus*, and *G. pulchellus* as their most important diagnostic characters (structure of the torular trinagle) cannot be scored in male specimens (in males of the *G. pulchellus* group the torular triangle is always open dorsally). Male specimens keyed out as "other *G. pulchellus* group males" most likely belong to these species.

1 Females: antenna clavate, A7–A12 wider than A3–A6 (Fig. 1A); A7–A12 with papillary sensilla on ventral surface; metasoma with 6 visible tergites **2**

– Males: antenna filiform, with A3–A12 equal in diameter (F5–F10 as wide as F1–F4; Fig. 1B); A7–A12 without papillary sensilla on ventral surface; metasoma with 7 visible tergites **12**

2 Torular triangle open dorsally, if closed then extending above horizontal midline of upper face (Figs 7B, 8C); Mesoscutum, pronotum and mesopectus largely yellow to orange (Figs 1A, 4–9, 27) ..... **3 (*G. pulchellus* group)**

– Torular triangle closed dorsally and not extending to horizontal midline of upper face (Figs 5A, 7A); Mesoscutum, pronotum and mesopectus black, sometimes with brown margins (Figs 10–14)..... **10 (*G. glabriceps* group)**

3 Medial area of lateral propodeal area setose (Fig. 9B) .... ***Gryonoides garciai* Masner & Mikó, sp. nov.**

– Medial area of lateral propodeal area glabrous (Fig. 5A) **4**

4 Dorsal metapleural area setose (Fig. 21C); Lateral propodeal area areolate-rugose (Fig. 21C); Scape in distal 2/3rd, pedicel, A3–A6 dark brown; clava yellow (Fig. 21A) ..... ***Gryonoides uruguayensis*** **Masner & Mikó, sp. nov.**

– Dorsal metapleural area glabrous; Lateral propodeal area not areolate rugose, traversed by one or two longitudinal carinae; color of antenna variable, not as above **5**

5 Posterior propodeal projection short, as long as wide (Figs 4A, 16, 18A)..... **6**

– Posterior propodeal projection more than 1.5 times as long as wide (Figs 5B, 6A, 6B) **7**

6 T3 with rugulose sculpture (Figs 4B, 6A); Setal bases on dorsal upper face pustulate (Fig. 7A); Vertex striate laterally, punctate medially (Fig. 4B); Torular triangle closed dorsally; Central keel present ..... ***Gryonoides brasiliensis*** **Masner & Mikó, sp. nov.**

– T3 smooth posterior to basal costae (Figs 5B, 7C); Setal bases on dorsal upper face smooth (Fig. 7B); Vertex smooth (Fig. 16A); Torular triangle open dorsally; central keel absent (Fig. 17C)..... ***Gryonoides obtusus*** **Masner & Mikó, sp. nov.**

7 Torular triangle open dorsally; Central keel absent (Figs 7A, B, 8C) **8**

– Torular triangle closed dorsally; Central keel present (Fig. 19B)..... **9**

8 Longitudinal midline of T3 with striae extending posteriorly from basal costae for half the length of the tergite (Fig. 8A); Clava gradually darkening apically (Fig. 8B); Posterior vertex punctate (Fig. 8A) ..... ***Gryonoides fuscoclavatus*** **Masner & Mikó, sp. nov.**

– Foveae along anterior T3 not extending into striation (Fig. 7C); Clava entirely yellow (Fig. 7D); Posterior vertex smooth (Fig. 7C) ..... ***Gryonoides flaviclavus*** **Masner & Mikó, sp. nov.**

9 T3 rugulose ..... ***Gryonoides paraguayensis*** **Masner & Mikó, sp. nov.**

– T3 smooth..... ***Gryonoides pulchellus*** **Dodd, 1920**

10 Dorsal metapleural area setose (Fig. 11A); Upper face with two transverse patches of dense, white setae (Figs 11A, 12B); Anterior propodeal pits absent (*e.g.* Fig. 18A); Lateral mesoscutellar spines distally curving ventrolaterally (Figs 11A, 12C, D) ..... ***Gryonoides glabriceps*** **Dodd, 1920**

– Dorsal metapleural area glabrous (Fig. 13C); Upper face without transverse patches of dense setation (Figs 13E, 14D); Anterior propodeal pits present (Figs 13F, 20B); Lateral mesoscutellar spines straight apically (Figs 13B, 14A)..... **11**

11 Punctures of upper face well separated and not contiguous (Fig. 13E); Compound eye in lateral view 2 times as high as wide (Fig. 13C); Head rounded in anterior view (longest head width in horizontal midline of head; 13E); T3 without rugulose sculpture (Fig. 13D); Notaulus absent (Figs 13B, 14A); Anterior propodeal pits adjacent to anterior end of lateral propodeal carinae (Fig. 13F) ..... ***Gryonoides mexicali*** **Masner & Mikó, sp. nov.**

– Punctures of upper face contiguous (Fig. 20A); Eye 1.5 times as high as wide in lateral view (Fig. 20D); Head triangular in anterior view (longest head width dorsal to horizontal midline of head; Fig. 20A); T3 with rugulose

sculpture (Fig. 20C); Notaulus present (Fig. 20E, F); Anterior propodeal pits lateral to anterior end of lateral propodeal carinae (Fig. 20B) ..... ***Gryonoides rugosus* Masner & Mikó, sp. nov.**

12 Spread and release structures (RSS) present on A3 and A4 (Figs 22A–C) ..... ***Gryonoides mirabilicornis* Masner & Mikó, sp. nov.**

– Spread and release structure absent from A3 present on A4 (Figs 12A, 18B) **13**

13 Notauli absent (Fig. 13B) .. ***Gryonoides mexicali* Masner & Mikó, sp. nov.**

– Notauli present (Figs 10A, B) **14**

14 Lateral mesoscutellar spines curved ventrolaterally (Figs 11A, 12C, D) ..... ***Gryonoides glabriceps* Dodd, 1920**

– Lateral mesoscutellar spines straight or curved medially (Figs 13B, 14A) **15**

15 Mesoscutellar spines curved medially (Fig. 6A) ..... ***Gryonoides paraguayensis* Masner & Mikó, sp. nov.**

– Mesoscutellar spines straight (Figs 15A, 19A) **16**

16 T3 with rugulose sculpture (Fig. 20C) ..... ***Gryonoides rugosus* Masner & Mikó, sp. nov.**

– T3 without rugulose sculpture (Figs 10A, B, 13D) **17**

17 Dorsal metapleural area setose (Fig. 21C) ..... ***Gryonoides uruguayensis* Masner & Mikó, sp. nov.**

– Dorsal metapleural area glabrous **18**

18 Posterior propodeal projection shorter than wide (Fig. 18A), setae on male antenna more than 2 times as long as flagellomere width (Fig. 17A) ..... ***Gryonoides obtusus* Masner & Mikó, sp. nov.**

– Posterior propodeal projection two times as long as wide (Fig. 18C), setae on male antenna less than 2 times as long as flagellomere width (Fig. 18B)..... **other *G. pulchellus* group males**

***Gryonoides brasiliensis* Masner & Mikó, sp. nov.**

http://zoobank.org/DCFAFF52-A28E-4A40-8D03-A19845F80BDE

Fig. 4

Diagnosis. *Gryonoides brasiliensis* shares the yellowish-orange coloration of the mesosoma and metasoma, the five dark apical clavomeres, the rugulose sculpture on T3 and a complete central keel and dorsally closed torular triangle with *G. paraguayensis*. The two species differ in the presence of carinae on the vertex in *Gryonoides brasiliensis* and the length of the posterior propodeal projection, which is as long as wide in *G. brasiliensis* whereas more than 1.5 times as long as wide in *G. paraguayensis*. *Gryonoides brasiliensis* shares the short posterior propodeal projection (as long as wide or shorter than wide) with *G. obtusus* and differs from this species in the rugulose T3 and the dorsally opened torular triangle.

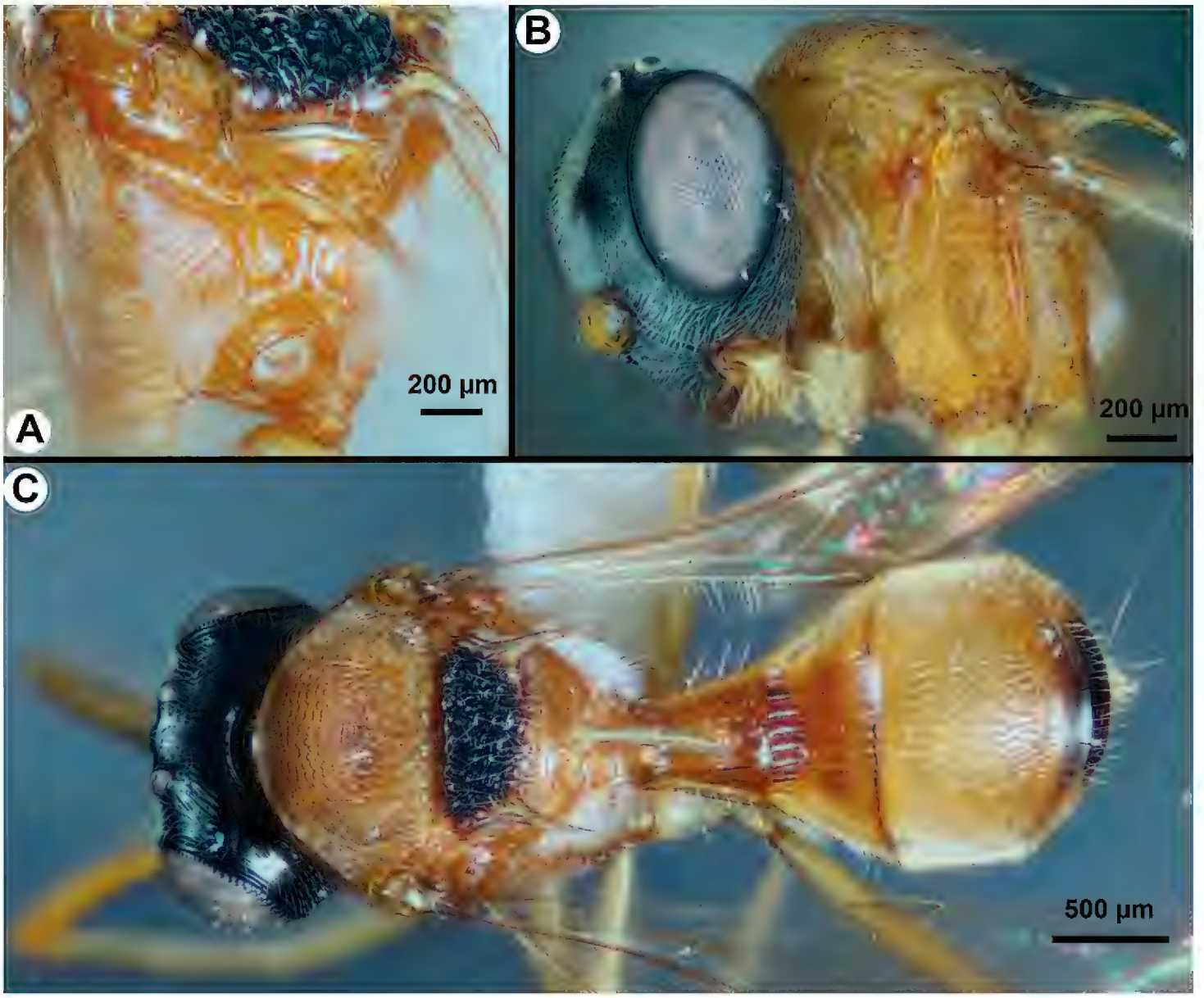

Figure 4. *Gryonoides brasiliensis* Masner & Mikó, sp. nov., female (CNCHymen_132936) **A** mesosoma, posterolateral view **B** head and mesosoma, lateral view **C** habitus, dorsal view.

Description. Body length: 2300–2400 µm. Color of head (female): black, interantennal process brown, mouthparts yellow. Antenna color female: radicle, scape, pedicel, A3, A4, A5, A6, A7 yellowish, A8, A9, A10, A11, A12 brown. Color of metasoma (female): T1, T2 light brown medially, T3 ochre, T4–T6 medial 3/4th brown, laterally ochre. Female radicle length: elongate, scape 4–4.5 times as long as radicle. Torular triangle and central keel continuity: torular triangle closed dorsally, continuous complete central keel. Torular triangle dorsal limit versus midlevel of upper face: torular triangle extending to horizontal (transverse) midline of upper face. Two bare patches equal width of 2–3 ocelli diameters present. Transverse setal fields on upper face: absent. Upper face sculpture: granulous dorsally. Upper face concavity dorsal view: convex. Central keel: present. Head shape anterior view: head triangular in anterior view (longest head width dorsal to horizontal midline of head). Occipital carina structure dorsomedially: crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: crenulate; punctate. Notaulus: present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: glabrous. Anteromedial pits of propodeum: absent. Area between plica and lateral propodeal carina sculpture: carinate

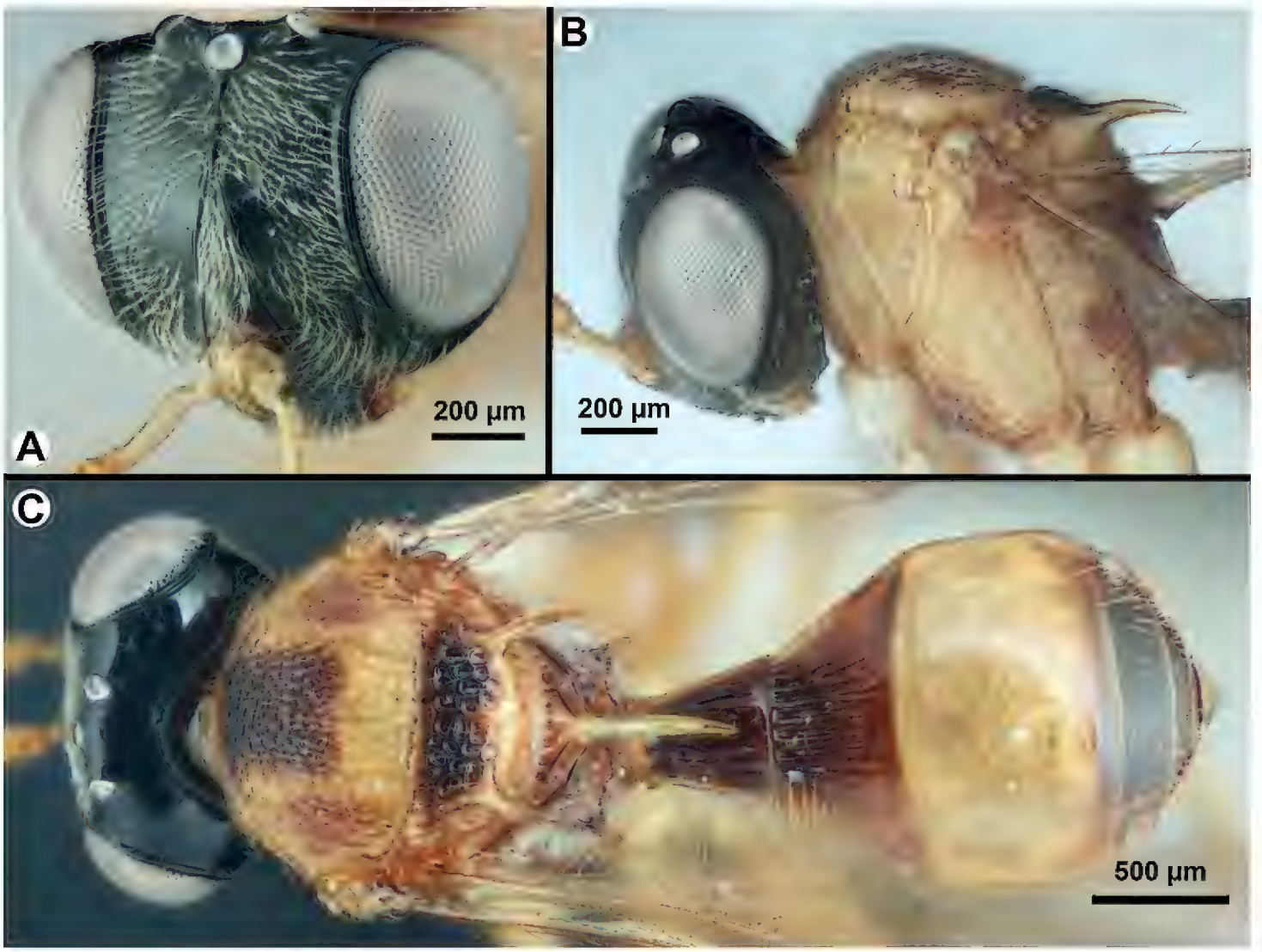

Figure 5. *Gryonoides pulchellus* vr. *Doddi* Dodd, 1920, female (CNCHymen_132948) **A** head, antero-lateral view **B** head and mesosoma, lateral view **C** head, mesosoma and metasoma, dorsal view.

(1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 2. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: as long as wide or wider than long. Rugulose sculpture on T3: present. T3 posterior 4/5th: sculptured.

Material. ***Holotype*:** Female, CNCHymen_132936 Brazil, Águas Vermelhas, Minas Gerais XII. 1983 M. Alvarenga (CNC). ***Paratype*:** Brasil - 1 female (CNCHymen_132937, CNC).

***Gryonoides flaviclavus* Masner & Mikó, sp. nov.**
http://zoobank.org/9C34EFDC-5660-4DF4-8E9E-D38E806CA02B
Figs 7B–D, 15

Diagnosis. *Gryonoides flaviclavus* is the most similar to *G. fuscoclavatus* as these species share the lack of dark brown or black apical flagellomeres and a central keel. The antenna of *G. flaviclavus* is exclusively yellow (*G. fuscoclavatus* has a distally gradually darkening clava; yellow proximally to light brown distally); basal grooves on T3 in *G. flaviclavus* do not extend to the transverse midline of the tergite (in *G. fuscoclavatus*,

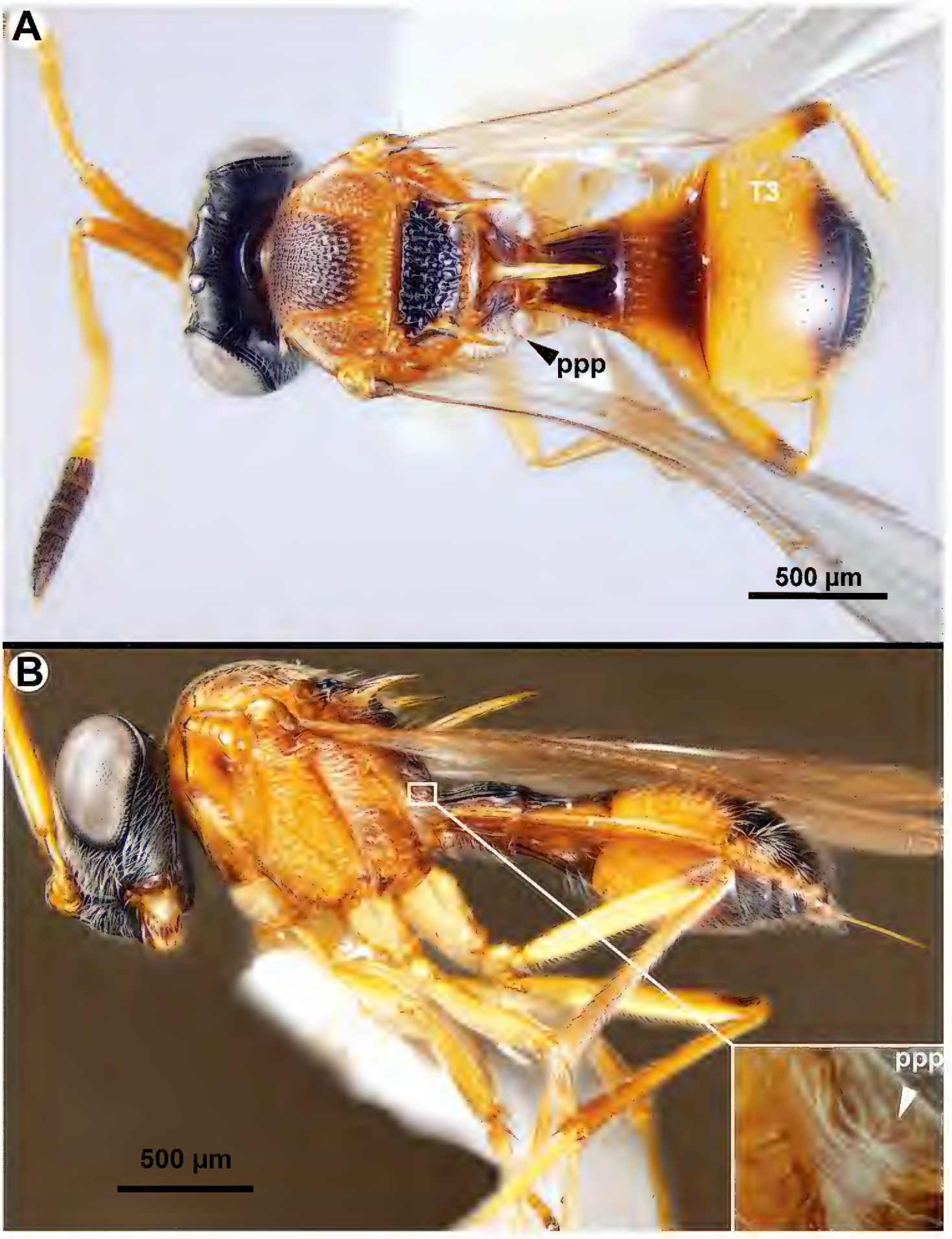

Figure 6. *Gryonoides paraguayensis* Masner & Mikó, sp. nov., female **A** habitus, dorsal view (CNCHymen_132918) **B** habitus, lateral view (CNCHymen_132935 ppp=posterior propodeal projection).

sulci arising from basal grooves exceed posteriorly midlevel of tergite) and the vertex posterior to lateral ocelli is with rare pilosity in *G. flaviclavus* (pilosity of the vertex more dense in *G. fuscoclavatus* relative to that of *G. flaviclavus*).

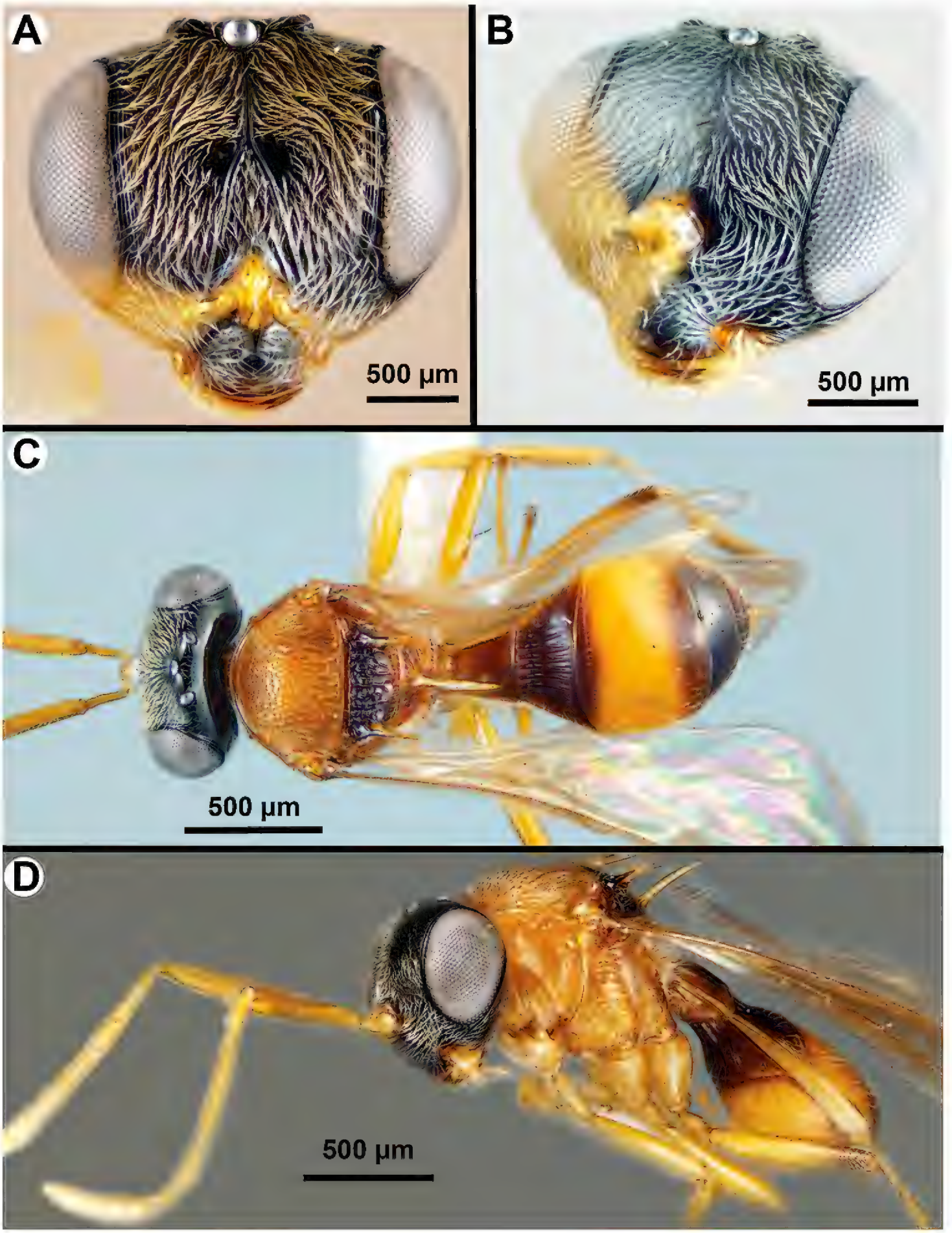

Figure 7. A *Gryonoides paraguayensis* Masner & Mikó, sp. nov., female, head, anterior view (CNCHymen_132935) **B–D** *Gryonoides flaviclavus* var. *flaviclavus* Masner & Mikó, sp. nov., female (CNCHymen_132762) **B** head, anterolateral view **C** head, mesosoma and metasoma, dorsal view **D** habitus, anterolateral view.

Description. *Gryonoides flaviclavus* var. *flaviclavus.* Body length: 2400–2600 µm. Color of mesosoma (female): orange. Color of metasoma (female): dark brown, laterotergites light brown. Torular triangle: present. Female radicle length:

elongate, scape 4–4.5 times as long as radicle. Torular triangle and central keel continuity: torular triangle opened dorsally, not continuous reduced central keel. Torular triangle dorsal limit versus midlevel of upper face: torular triangle extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face: absent. Upper face sculpture: granulous dorsally. Two bare patches lateral to dorsal region of torular triangle equal width of 2–3 ocelli diameter present. Upper face concavity dorsal view: convex. Central keel: present. Head shape anterior view: head rounded in anterior view (longest head width in horizontal midline of head). Occipital carina structure dorsomedially: not crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: smooth. Notaulus: present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: glabrous. Anteromedial pits of propodeum: absent. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 2. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3: absent. T3 posterior 4/5th sculpture: posterior 4/5th of tergite smooth; posterior 4/5th of tergite sculptured.

Gryonoides flaviclavus var. *nigrigaster*

Description. Body length: 1800–2000 μm. Color of head (female): black, interantennal process yellow, mouthparts yellow. Antenna color female: yellowish, radicle, scape darker than pedicel and flagellum. Color of mesosoma (female): mesoscutellum, hind femur distally brown, rest of mesosoma ochre. Color of metasoma (female): ochre, T2, T3 posteriorly, T4, T5, T6, S2, S4, S5, S6 brownish. Female radicle length: elongate, scape 4–4.5 times as long as radicle. Torular triangle and central keel continuity: torular triangle opened dorsally, not continuous reduced central keel. Torular triangle dorsal limit versus midlevel of upper face: torular triangle extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face: absent. Upper face sculpture: granulous dorsally. Two bare patches equal width of 2–3 ocelli diameters lateral to dorsal region of torular triangle present. Upper face concavity dorsal view: convex. Central keel: present. Head shape anterior view: head rounded in anterior view (longest head width in horizontal midline of head). Occipital carina structure dorsomedially: crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: smooth. Notaulus: present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: glabrous. Anteromedial pits of propodeum: absent. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 1; 2. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3: absent. T3 posterior 4/5th: smooth.

Comments. Most specimens of *Gryonoides flaviclavus* have a largely black mesoscutellum and only two specimens (CNCHymen_132756 from Brazil and one specimen from Peru) have an orange mesoscutellum (concolorous with the rest of the mesosoma). One specimen from Suriname (CNCHymen_132763) has a darker body and distally brownish scape. The rest of the antenna is yellow in this specimen. Specimens of *Gryonoides flaviclavus* var. *nigrigaster* are smaller than specimens of var. *flaviclavus* and differ from them in the exclusively black metasoma. The two varieties are geographically separated and may represent different subspecies or may even belong to different species. Since we did not find other differences than the coloration and body size, traits that are highly variable in Scelionidae, we treat the two forms as conspecific. *Gryonoides flaviclavus* superficially has a more northern distribution as numerous specimens have been collected from Venezuela, Suriname, and Colombia, whereas *G. fuscoclavatus* has a more southern distribution with many specimens from Bolivia (Fig. 25). The geographic distribution of the two species overlap in Peru and Brazil, however. The differences between *G. flaviclavus* and *G. fuscoclavatus* might represent intraspecific variability in coloration, vertex pilosity, and T3 sulcus length. We have located only one specimen from Brazil (CNCHymen_132722) where antenna coloration is contradicted by two body characters as one has long T3 sulci and dense setae on vertex, but exclusively yellow antenna.

Material. ***Holotype*:** female, CNCHymen_135290, Peru: Huanuco, Rio Llullapichis, 9°37'S, 74°56'W, 260m, 1.IX.1981 M. von Tschirnhaus, primary forest YPT (CNC). ***Paratypes*:** var. *flaviclavus*: Brasil - 3 females (CNC), Colombia - 1 female (CNC), Peru - 14 females (CNC), Suriname - 2 females (CNC), Venezuela - 19 female (CNC); var. *nigrigaster*: Panama - 20 females (CNC).

Gryonoides fuscoclavatus Masner & Mikó, sp. nov.

http://zoobank.org/E2E0F1E1-8A96-4CD6-8354-1567B5DBF58D

Fig. 8

Diagnosis. *Gryonoides fuscoclavatus* is the most similar to *G. flavicava* as these species share the lack of dark brown or black apical flagellomeres and a central keel. The antenna of *G. flaviclavus* is exclusively yellow (*G. fuscoclavatus* has a distally gradually darkening clava; yellow proximally to light brown distally); basal grooves on T3 in *G. flaviclavus* do not extend to the transverse midline of the tergite (in *G. fuscoclavatus*, sulci arising from basal grooves exceed posteriorly midlevel of tergite) and the vertex posterior to lateral ocelli is with rare pilosity in *G. flaviclavus* (pilosity of the vertex more dense in *G. fuscoclavatus* relative to that of *G. flaviclavus*).

Description. Body length: 2300–2400 μm. Color of head (female): black, interantennal process, radicle, scape, pedicel, A3, A4, A5, A6, A7 yellow, A8, A9, A10, A11, A12 brown. Color of mesosoma (female): mesoscutellum, hind femur distally brown, rest of mesosoma ochre. Color of metasoma (female): dark brown, only anterior 4/5th of T3 orange; brown, only anterior 4/5th of T3 , T2, T1, and S2, S1 laterally

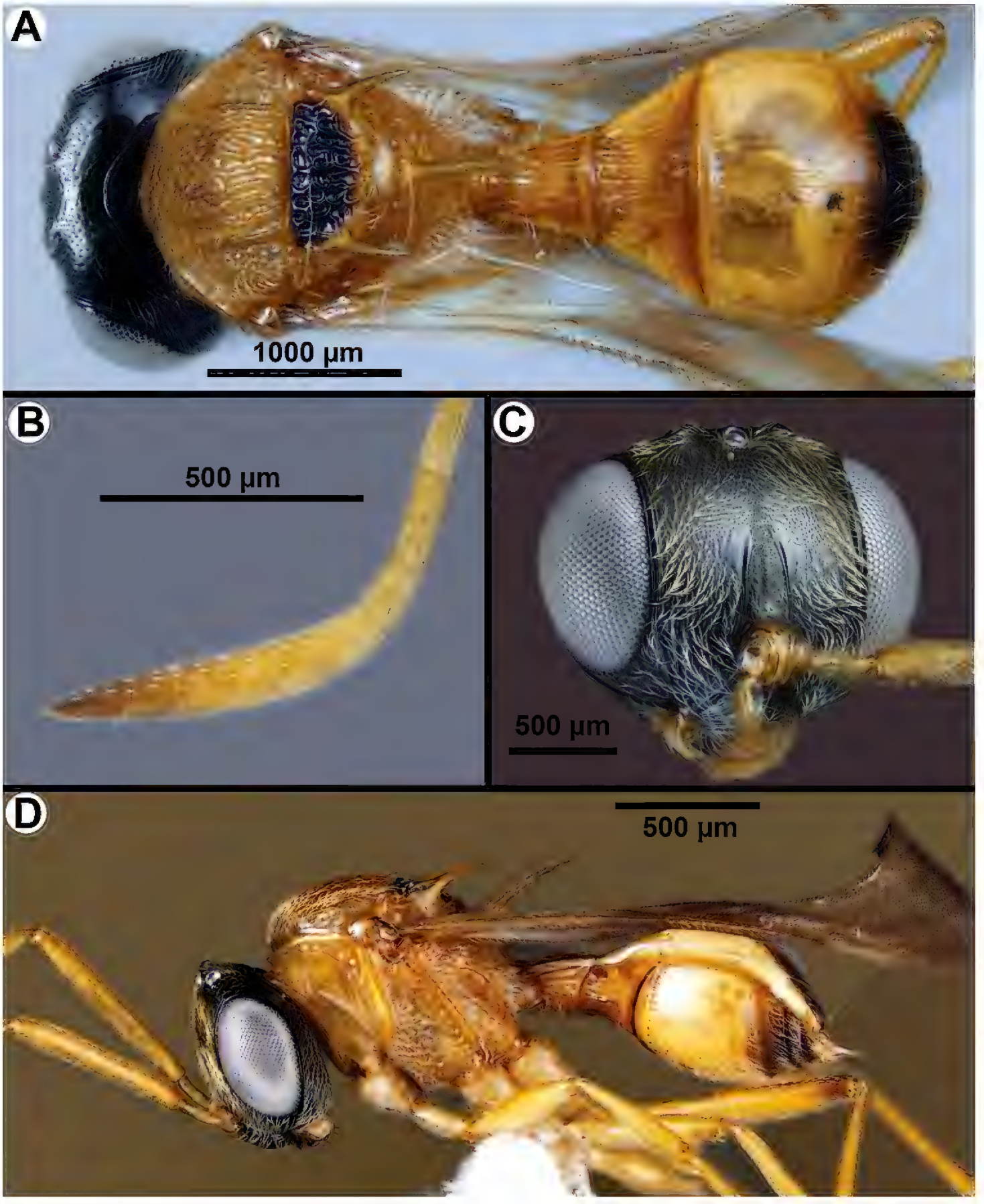

Figure 8. *Gryonoides fuscoclavatus* Masner & Mikó, sp. nov., female **A** habitus, dorsal view (CNCHymen_132699) **B** antenna, lateral view (CNCHymen_132699) **C** head, anterior view (CNCHymen_132699) **D** habitus, lateral view (CNCHymen_132716).

orange; ochre, only tergites posterior to T3 brown. Female radicle length: elongate, scape 4–4.5 times as long as radicle. Torular triangle and central keel continuity: torular triangle opened dorsally, not continuous reduced central keel. Torular triangle: present. Torular triangle dorsal limit versus midlevel of upper face: torular triangle

extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face: absent. Upper face sculpture: granulous dorsally. Two bare patches equals width of 2–3 ocelli diameters lateral to torular triangle present. Upper face concavity dorsal view: convex. Central keel: absent. Head shape anterior view: head triangular in anterior view (longest head width dorsal to horizontal midline of head). Occipital carina structure dorsomedially: crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: punctate. Notaulus: present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: glabrous. Anteromedial pits of propodeum: absent. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 1. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3: absent. T3 posterior 4/5th: sculptured.

Comments. See comments of *G. flaviclavus*.

Material. ***Holotype*** (female): CNCHymen_135304, Peru: Huauco, Rio Llullapichis, 9°37'S, 74°56'W, 260m, 1.ix.1981 M. von Tschirnhaus, primary forest YPT. ***Paratypes*:** Bolivia - 21 females (CNC), Brasil - 1 female (CNC), Peru - 19 females (CNC).

Gryonoides garciai Masner & Mikó, sp. nov.

http://zoobank.org/6B2753B9-1E36-4EC6-AADB-C394B54AF2BB

Fig. 9

Diagnosis. *Gryonoides garciai* is the only *Gryonoides* species with a medially setose lateral propodeal area. The antennal coloration of this species is also unique: the distal 5 clavomeres are dark brown to black in contrast to the yellow, more proximal antennal regions.

Description. Body length: 2100–2500 µm. Color of head (female): black, interantennal process yellow, mouthparts yellow. Antenna color female: radicle, scape, pedicel, A3, A4, A5, A6, A7 proximally yellow, A7 distally, A8, A9, A10, A11, A12 brown. Color of mesosoma (female): mesoscutellum, hind femur distally brown, rest of mesosoma ochre. Color of metasoma (female): ochre, T2, T3 posteriorly, T4, T5, T6, S2, S4, S5, S6 brownish. Female radicle length: elongate, scape 4–4.5 times as long as radicle. Torular triangle and central keel continuity: torular triangle opened dorsally, not continuous reduced central keel. Torular triangle: present. Torular triangle dorsal limit versus midlevel of upper face: torular triangle extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face: absent. Upper face sculpture: granulous dorsally. Two bare patches equals the width of 2–3 ocelli diameter lateral to torular triangle present. Upper face concavity dorsal view: convex. Central keel: present. Head shape anterior view: head rounded in anterior view (longest head width in horizontal midline of head). Occipital carina structure dorsomedially: crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: smooth. Notaulus: present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: with

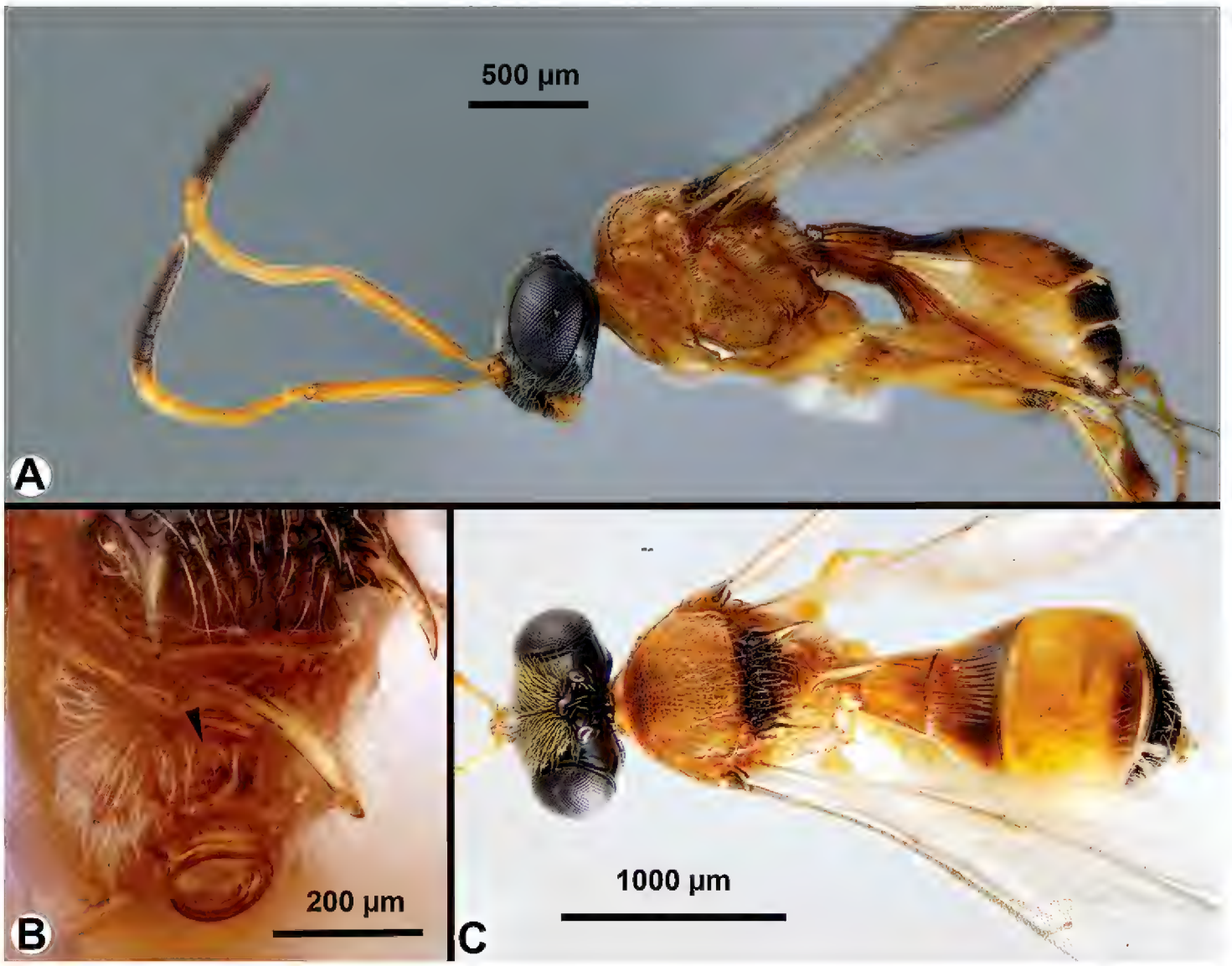

Figure 9. *Gryonoides garciai* Masner & Mikó, sp. nov., female (CNCHymen_132694) **A** habitus, lateral view **B** posterior mesosoma, posterodorsal view **C** head, mesosoma and metasoma, dorsal view. A1–A6 yellow, A7 light brown, A8–A12, dark brown; vertex with rare setae. Median portion of lateral propodeal area with rare setae (arrow); T3 not rugulose and basal groves not extending to midline.

setae. Anteromedial pits of propodeum: absent. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 1. Medial region of lateral propodeal area pilosity: with few setae. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3: absent. T3 posterior 4/5th: smooth.

Material. ***Holotype*:** Female, CNCHymen_132692, Venezuela: Aragua El Limon, Poso del Diablo, creek, 600m. 18.IV.1994 L. Masner, V94–22 YPT. ***Paratypes*:** Venezuela - 7 females (CNC).

Gryonoides glabriceps Dodd, 1920

Figs 10, 11, 12

Gryonoides glabriceps Dodd, 1920: 361 (original description); Masner, 1965: 98 (type information); Johnson, 1992: 513 (cataloged, type information).

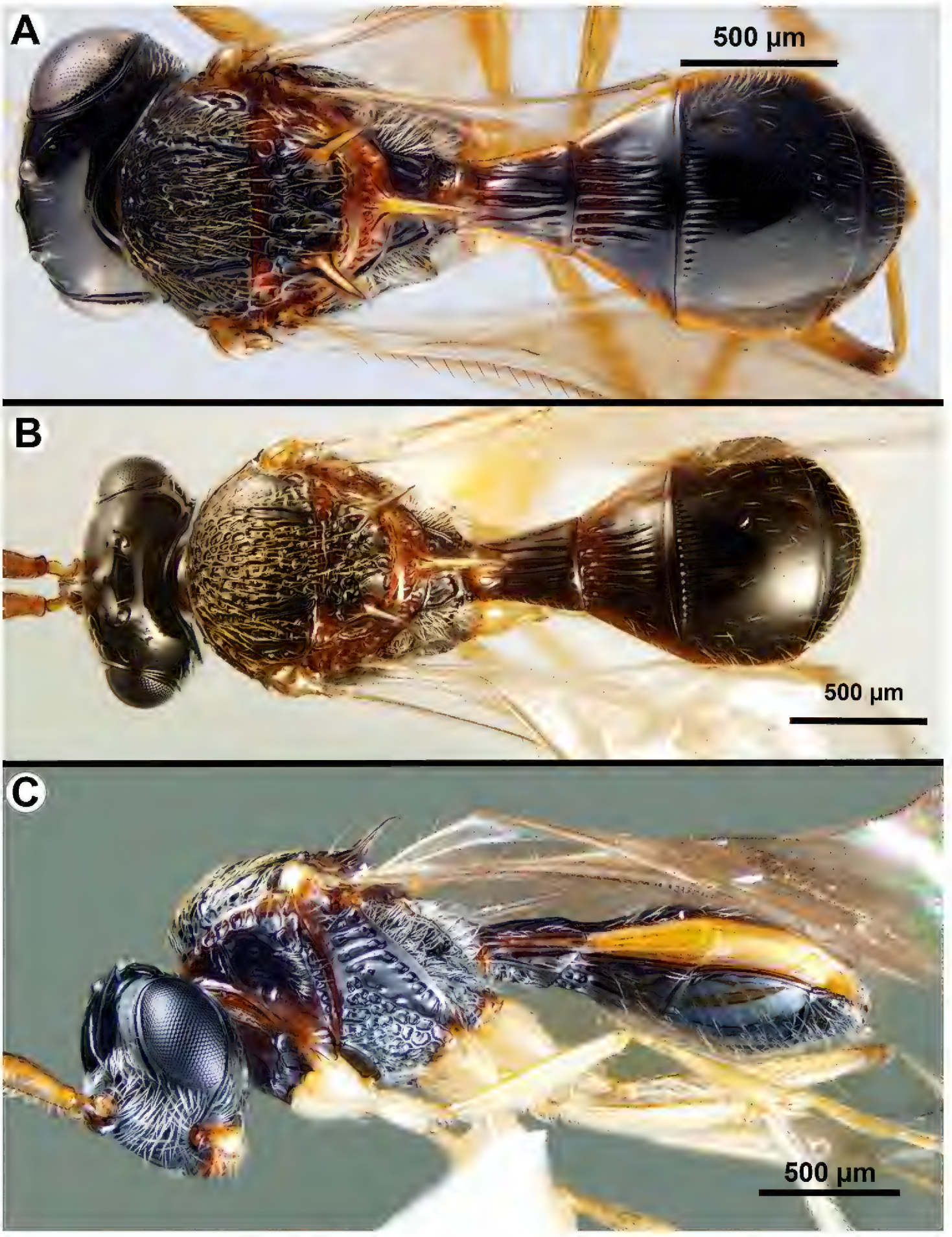

Figure 10. *Gryonoides glabriceps* Dodd, 1920, habitus **A** female, dorsal view (CNCHymen_132135) **B** male, dorsal view (CNCHymen_132133) **C** male, lateral view (CNCHymen_132133).

Diagnosis. *Gryonoides glabriceps* differs from all other *Gryonoides* species by having the lateral mesoscutellar spines curved distally ventrolaterally. Females of *Gryonoides glabriceps* possess two transverse, setiferous bands on the upper face. The species is most similar to *G. mexicali* and *G. rugosus* in having the dorsally closed torular tri-

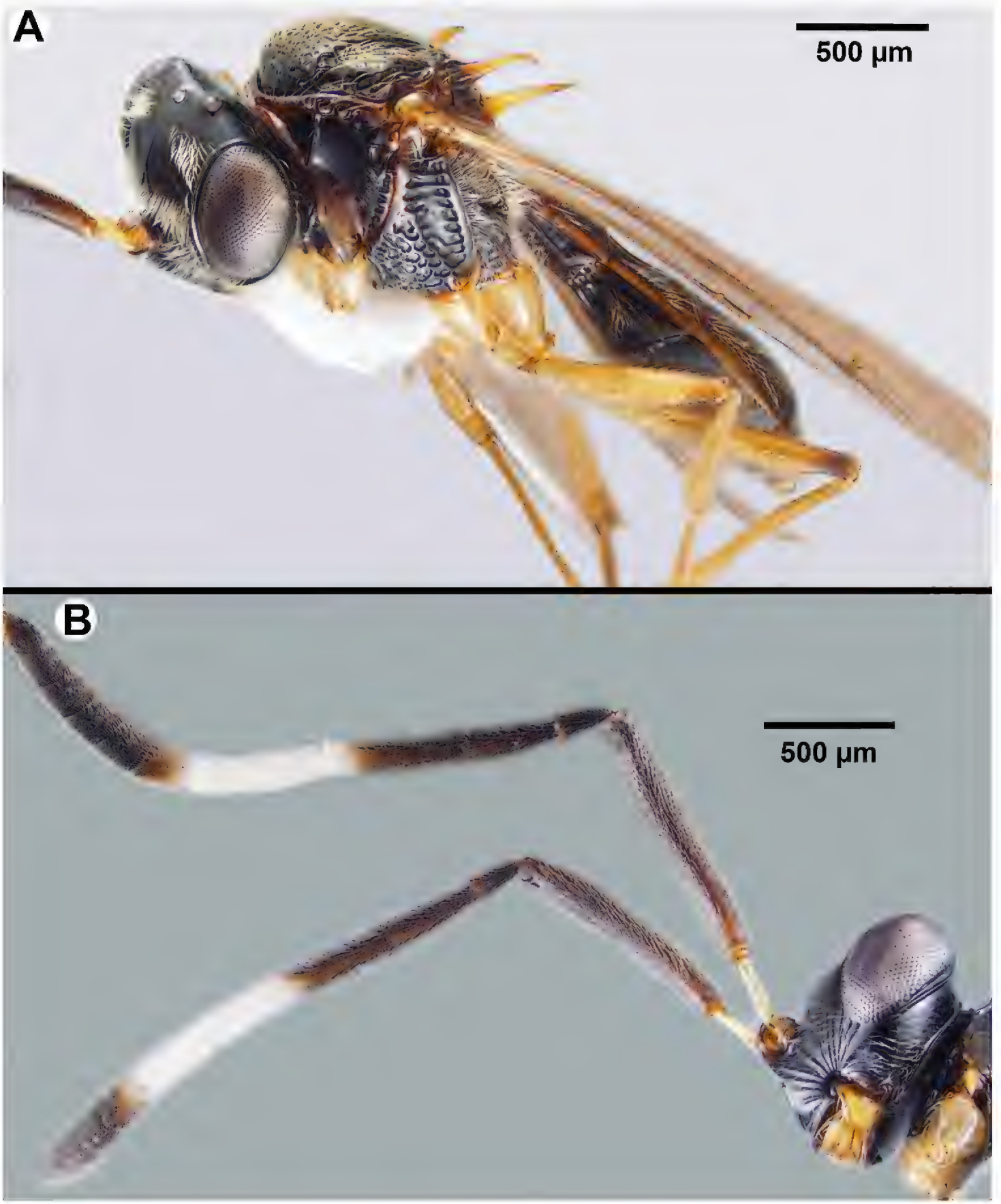

Figure 11. *Gryonoides glabriceps* Dodd, 1920, female (CNCHymen_132135) **A** head, mesosoma and metasoma, anterolateral view **B** head and antenna, ventrolateral view.

angle located ventrally of the horizontal midline of the upper face and differs from them in the setose dorsal metapleural area, the absence of the anterior propodeal pits and the distally ventrolaterally curving lateral mesoscutellar spines. The length of setae on male flagellomeres in *G. mexicali* and *G. rugosus* are shorter than flagellomere width whereas in *G. glabriceps*, setae are 2 times as long as flagellomere width.

Description. Body length: 1900–2900 µm. Color of head (female): black, interantennal process brown, mouthparts yellow. Antenna color female: radicle yellow, scape,

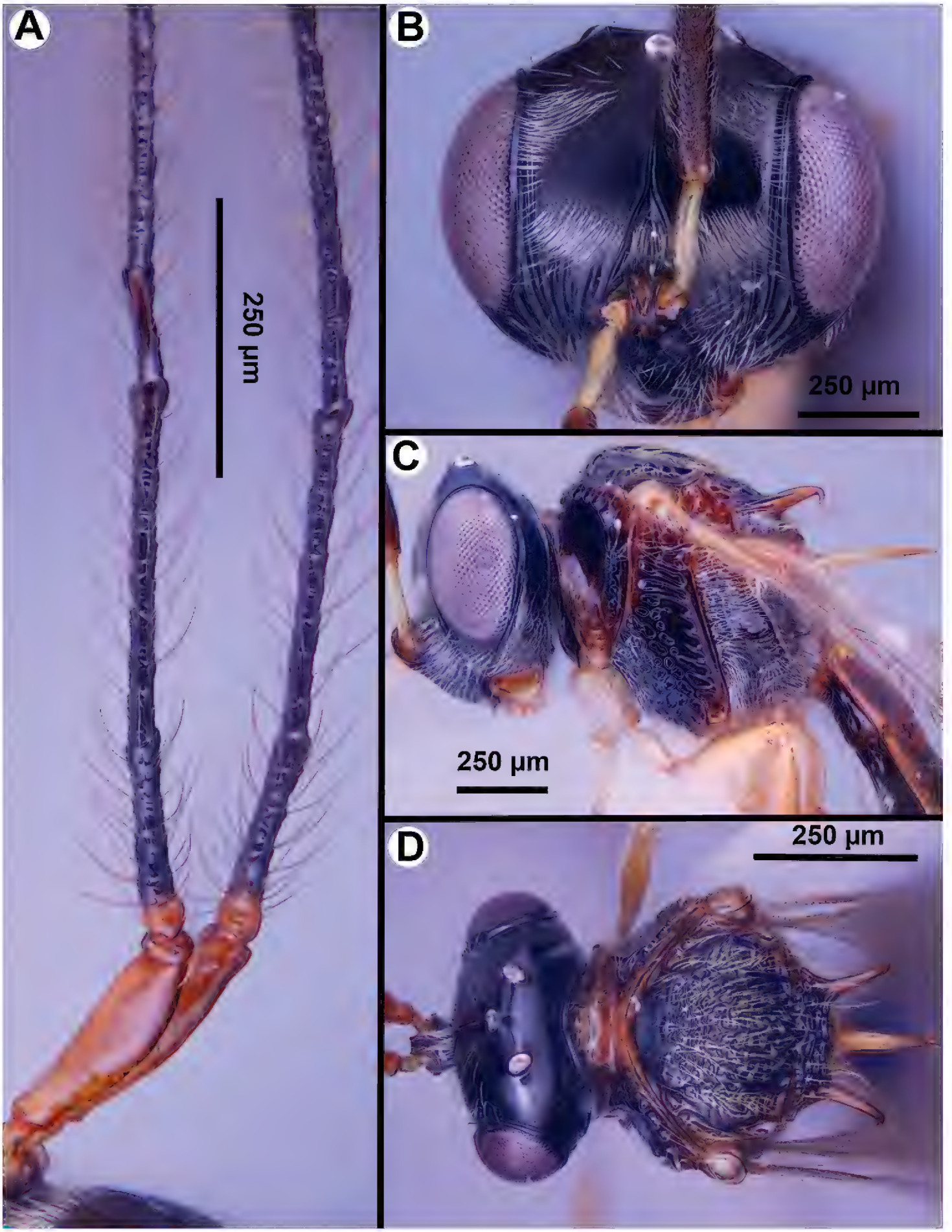

Figure 12. *Gryonoides glabriceps* Dodd, 1920 **A** antenna, male (CNCHymen_131929) **B** head, anterior view, female (CNCHymen_131948) **C** head, mesosoma, lateral view, female (CNCHymen_131948) **D** head, mesosoma, dorsal view, male (CNCHymen_131959).

A2, A3, A4, A5 proximally, A8, A9, A10, A11, A12 browns, A5 distally, A6, A7 yellowish. Color of mesosoma (female): legs, tegula, lateral mesoscutellar spines, metascutellar spine yellowish, axillae, metanotum, lateral region of pronotal rim reddish, rest of

mesosoma black. Color of metasoma (female): dark brown, laterotergites light brown. Female radicle length: elongate, scape 4–4.5 times as long as radicle. Length of setae on male flagellomeres: more than 2 times as long as flagellomere width. Torular triangle and central keel continuity: torular triangle closed dorsally, continuous complete central keel. Torular triangle: present. Torular triangle dorsal limit versus midlevel of upper face: torular triangle not extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face: present. Upper face sculpture: punctate dorsally. Trapezoid bare area extending medially to anterior ocellus present. Upper face concavity dorsal view: convex. Central keel: present. Head shape anterior view: head rounded in anterior view (longest head width in horizontal midline of head). Occipital carina structure dorsomedially: not crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: smooth. Notaulus: present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: with setae. Anteromedial pits of propodeum: absent. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 1; 2. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3: absent. T3 posterior 4/5th: sculptured.

Material. ***Holotype*:** Male, Teapa, Tabasco, March, H.H.S. ; Godman-Salvin Coll. 1904-1; BMNH type label ; *Gryonoides glabriceps* Dodd (BMNH). ***Paratype*:** MEXICO 1 male (BMNH). Other material examined (CNC, USNM): Belize - 24 females and 12 males, Columbia - 5 females, Costa Rica - 177 females and 164 males, Ecuador - 15 female, El Salvador - 2 females, Honduras - 2 females, Mexico - 20 females and 4 males, Panama - 57 females and 42 males, Venezuela - 2 females.

***Gryonoides mexicali* Masner & Mikó, sp. nov.**
http://zoobank.org/85910E20-DD76-4947-8043-0EB30371A8AB
Figs 13, 14

Diagnosis. *G. mexicali* is most similar to *G. glabriceps* and *G. rugosus* in having the dorsally closed torular triangle located ventrally of the horizontal midline of the upper face. *G. rugosus* and *G. mexicali* differ from *G. glabriceps* in having the dorsal metapleural area glabrous, female upper face without transverse patches of dense setation, presence of anterior propodeal pits and apically straight lateral mesoscutellar spines. *G. mexicali* differs from *G. rugosus* in having punctures of upper face not adjacent to each other, 2 times as high as wide compound eye in lateral view, rounded head capsule in anterior view (longest head width in horizontal midline of head), T3 without striation medially and absence of notauli and anterior propodeal pits adjacent to anterior end of lateral propodeal carinae.

Description. Body length: 2200–2600 μm. Color of head (female): black, interantennal process borwn, mouthparts yellow. Antenna color female: scape distally, pedicel proximally, A6, A7, A8, A9, A10, A11, A12 brown, A3, A4, A5 yellowish. Color of mesosoma (female): black, except tegula, tip of lateral mesoscutellar spinse and metascutellar spine light brown. Color of metasoma (female): dark brown, lateroter-

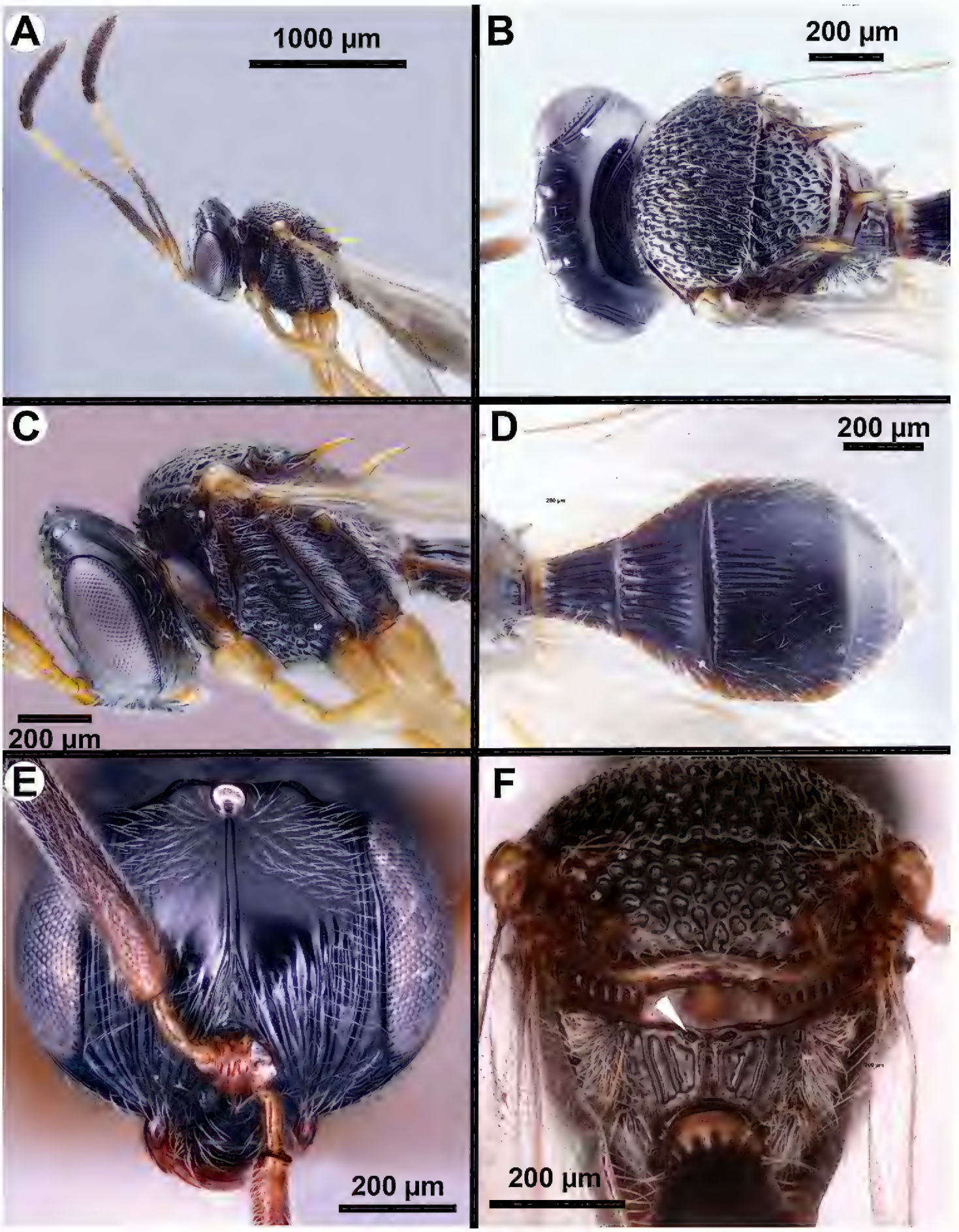

Figure 13. *Gryonoides mexicali* Masner & Mikó, sp. nov., female **A** habitus, lateral view **B** head and mesosoma, dorsal view **C** head and mesosoma, lateral view **D** metasoma, dorsal view **E** head, anterior view **F** mesosoma, posterior view (CNCHymen_132003), arrow pointing to anterior propodeal pit.

gites light brown. Female radicle length: scape 6.5–7 times as long as radicle. Length of setae on male flagellomeres: setae on male flagellomeres shorter than flagellomere width. Torular triangle and central keel continuity: torular triangle closed dorsally, continuous complete central keel. Torular triangle : present. Torular triangle dorsal

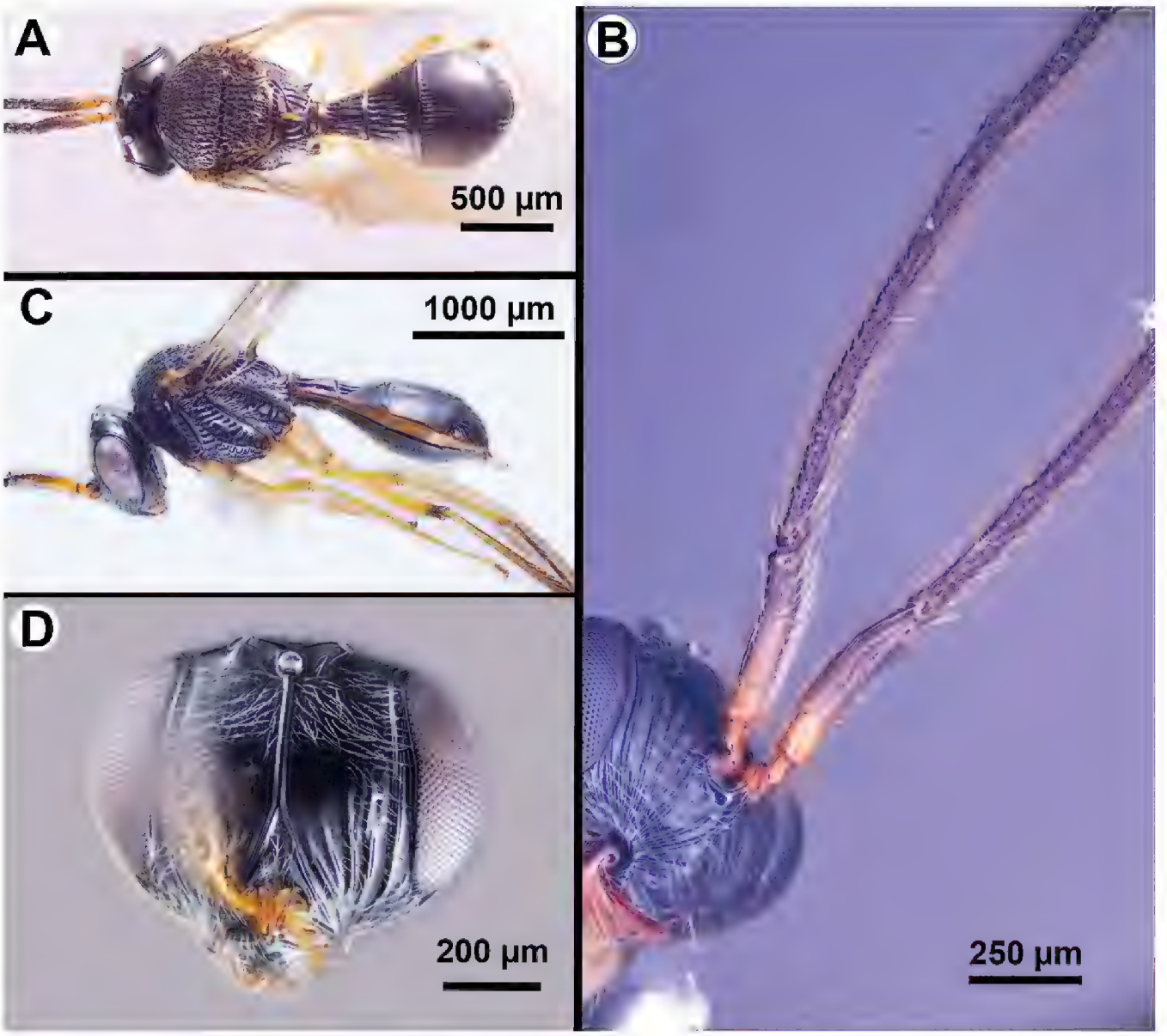

Figure 14. *Gryonoides mexicali* Masner & Mikó, sp. nov. **A** habitus of female, dorsal view (CNCHymen_132006) **B** head and proximal antenna of male anteroventral view **C** habitus of female, lateral view (CNCHymen_132006) **D** head, anterior view (CNCHymen_132026).

limit versus midlevel of upper face: torular triangle not extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face : absent. Upper face sculpture: punctate dorsally. Two bare patches with diameter distinctly larger than 2–3 ocelli diameters lateral to dorsal region of torular triangle present. Upper face concavity dorsal view: convex. Central keel : present. Head shape anterior view: head rounded in anterior view (longest head width in horizontal midline of head). Occipital carina structure dorsomedially: not crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: smooth. Notaulus : absent. Dorsal metapleural area: glabrous. Anteromedial pits of propodeum: present. Anteromedial pits of the propodeum versus lateral propodeal carina: pits adjacent to anterior end of lateral propodeal carinae. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 2. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3 : absent. T3 posterior 4/5th: scultpured.

Material. ***Holotype*:** Female, CNCHymen_132014, Mexico: Oaxaca Comaltepec, 5–13.xii.2008 La Esparanza, 1600m 17.62661°N 96.36950°W A. Lopez Garcia,

Figure 15. *Gryonoides flaviclavus* var. *nigrigaster* Masner & Mikó, sp. nov., female, habitus (CNCHymen_132772) **A** head, mesosoma and metasoma, dorsal view **B** habitus, lateral view.

MT edge of montane cloud forest. ***Paratypes*:** Guatemala - 9 females and 4 males (CNC), Mexico - 15 females and 9 males (CNC).

***Gryonoides mirabilicornis* Masner & Mikó, sp. nov.**
http://zoobank.org/480DEACA-A4A1-4EBF-9F7C-645782B5FCEC
Figs 22, 23

Diagnosis. *Gryonoides mirabilicornis* differs from all other teleasine species in having tyloids (keel like release and spread structures, Isidoro et al. 1996) on A5 and A6.

Description. Body length: 2620–2700 μm. Antenna color: scape and pedicel yellow, flagellum dark brown. Color of head: dark brown. Color of mesosoma: legs, tegula, lateral mesoscutellar spines, metascutellar spine yellowish, axillae, metanotum, lateral region of pronotal rim reddish, rest of mesosoma black. Color of metasoma: dark brown. Length of setae on male flagellomeres: more than 2 times as long as flagellomere width. Torular triangle : absent. Transverse setal fields on upper face : absent. Upper face sculpture: punctate dorsally. Upper face concavity dorsal view: convex. Central keel : absent. Head shape anterior view: head rounded in anterior view (longest head width in horizontal midline of head). Occipital carina structure dorsomedially: not crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: smooth. Notaulus : present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: glabrous. Anteromedial pits of propodeum: absent. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 1. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3 : absent. T3 posterior $4/5^{th}$: smooth.

Comments. We are not aware of a similar RSS pattern in Teleasinae, Telenominae and more derived Scelioninae. The geometry of the female antenna and the distribution pattern of uniporous olfactory sensilla have been reported to correspond to the male RSS (Isidoro et al. 1996) in some parasitic Hymenoptera. Bin et al. 1989 have observed that *Trissolcus basalis* males are touching the female antenna during copulation "entwining his around hers and repeatedly". Although a the female receptor for the gland extract has not been identified, it is most reasonable to assume that the distinct change in male RSS morphology in *G. mirabilicornis* most likely corresponds to unique modifications on the female antenna of the same species. Specimens of *G. mirabilicornis* were collected together along with some female specimens of *G. flaviclavus* and *G. fuscoclavatus*. We did not find differences in the antennal morphology and sensilla pattern between the female antenna of these two species and other *Gryonoides*. Therefore, we consider the 3 male specimens with modified antennae to be a separate species.

Material. Holotype: male, UNHC_0020586, PERU, Manu, Villa, Carmen, Pilicopata, 518m, 12°53'03"S, 71°24'16"W, 28.xi.2011, J. Heraty, mature forest, sweeping (CNC). Paratypes: PERU, 2 males (CNC)

***Gryonoides obtusus* Masner & Mikó, sp. nov.**
http://zoobank.org/F6B66C82-FB08-4C58-94B8-681FDB4F03D3
Figs 16, 17, 18A

Diagnosis. *Gryonoides obtusus* shares the glabrous medial area of lateral propodeal area and dorsal metapleural area, and the short posterior propodeal projection (shorter than wide) with *G. brasiliensis* and differs from this species in the smooth T3 and the dorsally closed torular triangle. Males of *G. obtusus* share the long setae on the antenna (more than 2 times as long as flagellomere width) with *G. paraguayensis* and differ from this species in the short posterior propodeal projection and the rugulose T3.

Description. Body length: 2500–3100 μm. Color of head (female): black, interantennal process yellow, mouthparts yellow. Antenna color female: radicle, scape proximally light brown, scape distally, pedicel, A3, A4 proximally, A8, A9, A10, A11, A12 brown, A4 distally, A5, A6, A7 white. Color of mesosoma (female): mesoscutellum black, dorsal metapleural region, dorsal mesopectal region medial region of mesoscutum with brownish spot, rest of mesosoma orange. Color of metasoma (female): dark brown, only anterior 4/5th of T3 orange. Female radicle length: elongate, scape 4–4.5 times as long as radicle. Length of setae on male flagellomeres: more than 2 times as long as flagellomere width. Torular triangle and central keel continuity: torular triangle opened dorsally, not continuous reduced central keel. Torular triangle : present. Torular triangle dorsal limit versus midlevel of upper face: torular triangle extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face : absent. Upper face sculpture: granulous dorsally. Transverse bare band extending between inner margin of eyes present. Upper face concavity dorsal view: convex. Central keel : present; absent. Head shape anterior view: head rounded in anterior view (longest head width in horizontal midline of head). Occipital carina structure dorsomedially: not crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: smooth. Notaulus : present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: glabrous. Anteromedial pits of propodeum: absent. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 2. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: as long as wide or wider than long. Rugulose sculpture on T3 : absent. T3 posterior 4/5th: smooth.

Material. ***Holotype*:** female, CNCHymen_132954, Bolivia: LaPaz, Chulumani Apa-Apa, 16°22'S, 67°30'W, 1–4.V.1997, 1800m, L. Masner, YPT B9-11. ***Paratypes*:** Bolivia - 14 females and 29 males (CNC), Peru - 1 female (CNC).

***Gryonoides paraguayensis* Masner & Mikó, sp. nov.**
http://zoobank.org/D6DB735F-42C7-4785-A8D0-F5741ED06321
Figs 6, 7A

Diagnosis. *Gryonoides paraguayensis* is the most similar to *G. pulchellus* (the two species share the glabrous medial area of lateral propodeal area and dorsal meta-

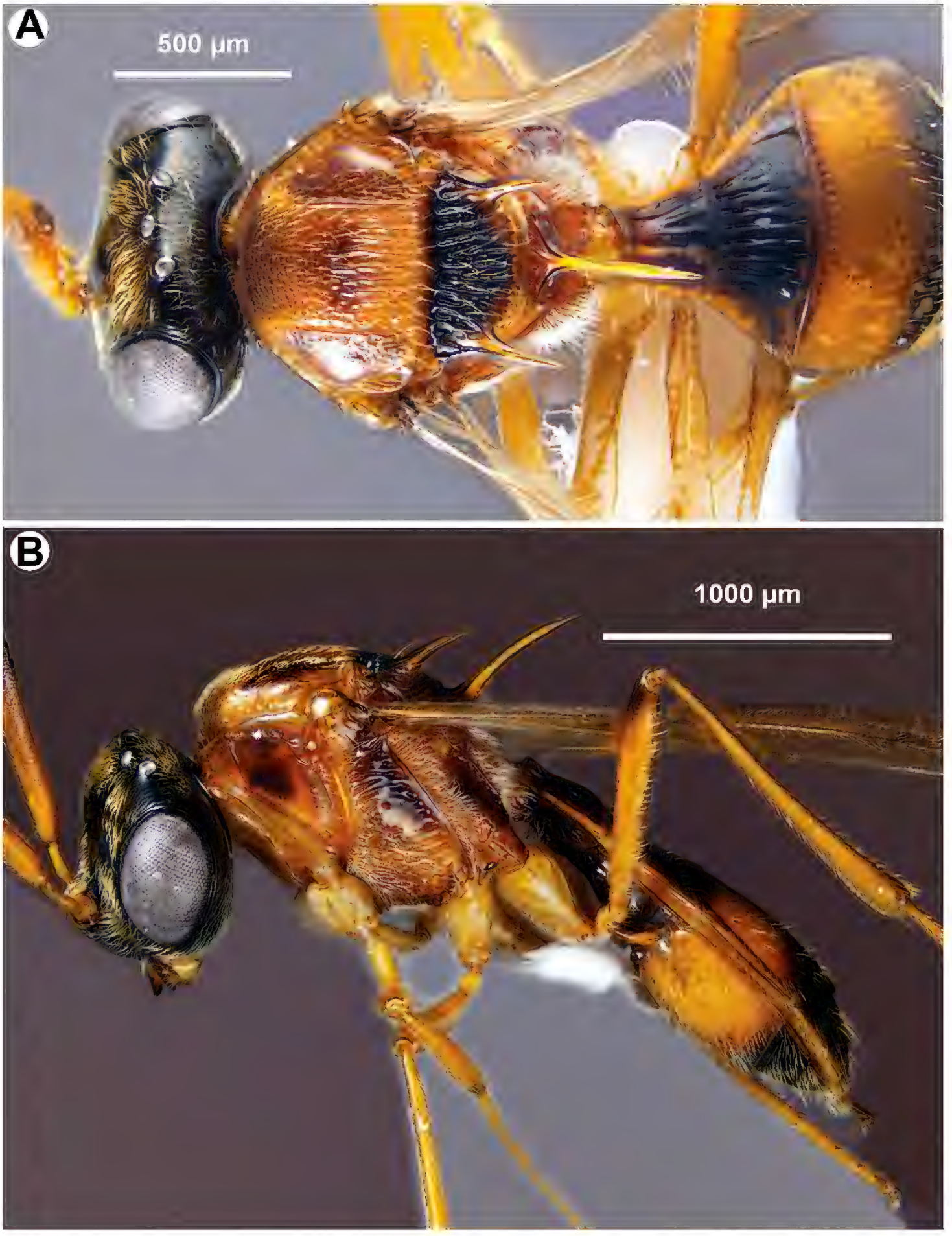

Figure 16. *Gryonides obtusus* Masner & Mikó, sp. nov., female ((CNCHymen_132957) **A** habitus, dorsal view **B** habitus, lateral view.

pleural area, and the long posterior propodeal projection (at least 1.5 times as long as wide), and the dorsally closed torular triangle) and differs from this species in the rugulose T3. Males of *G. paraguayensis* have longer setae on its flagellomeres (more than two times as long as flagellomere width), whereas males of the *puchellus*

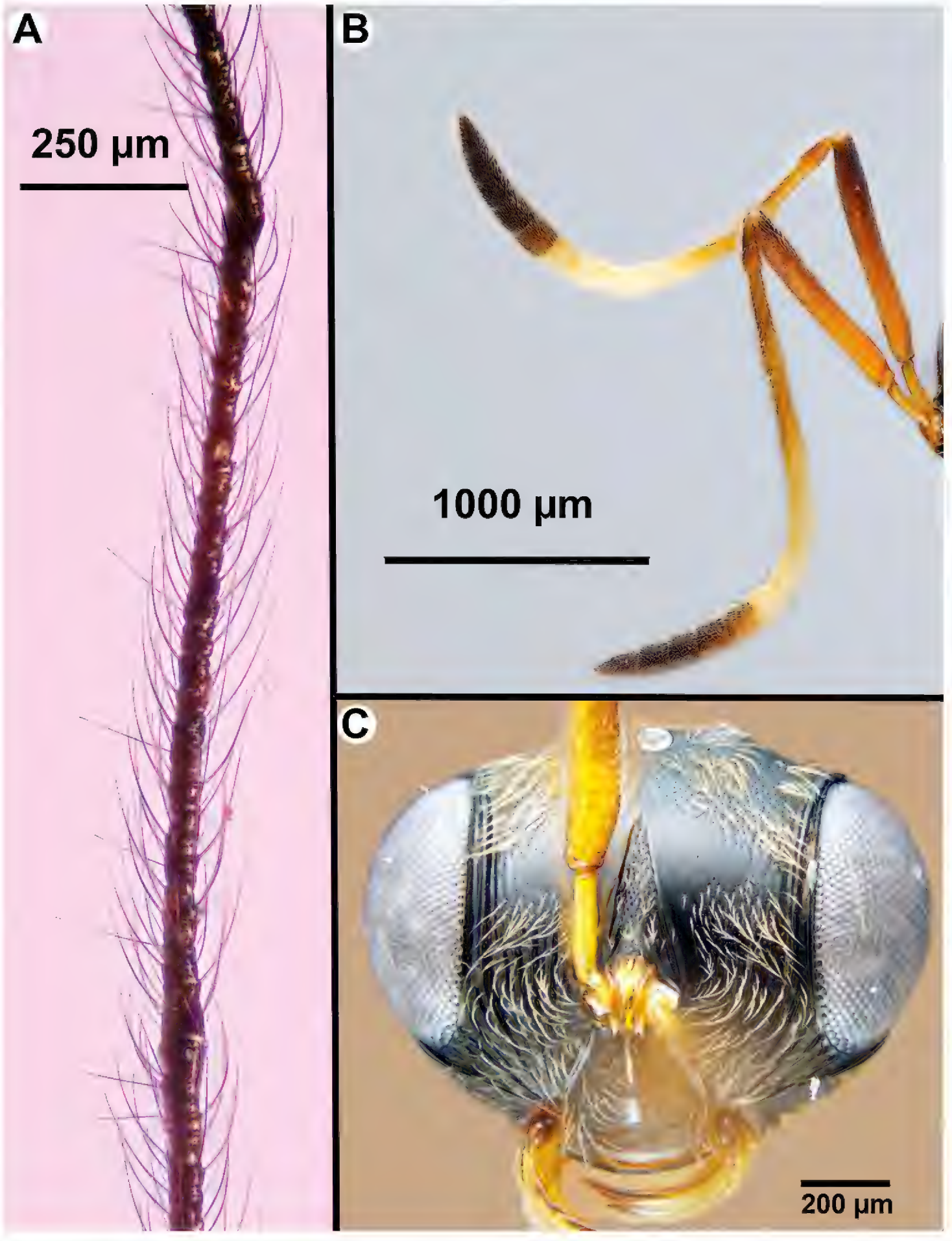

Figure 17. *Gryonoides obtusus* Masner & Mikó, sp. nov. **A** male antenna **B** female antenna, lateral view (CNCHymen_132957) **C** head, anterior view (CNCHymen_132957).

group have shorter setae on their flagellomeres (less than 2 times as long as flagellomere width).

Description. Body length: 2450–3125 µm. Male antenna color: scape and pedicel yellow, flagellum dark brown. Color of head (female): black, interantennal process

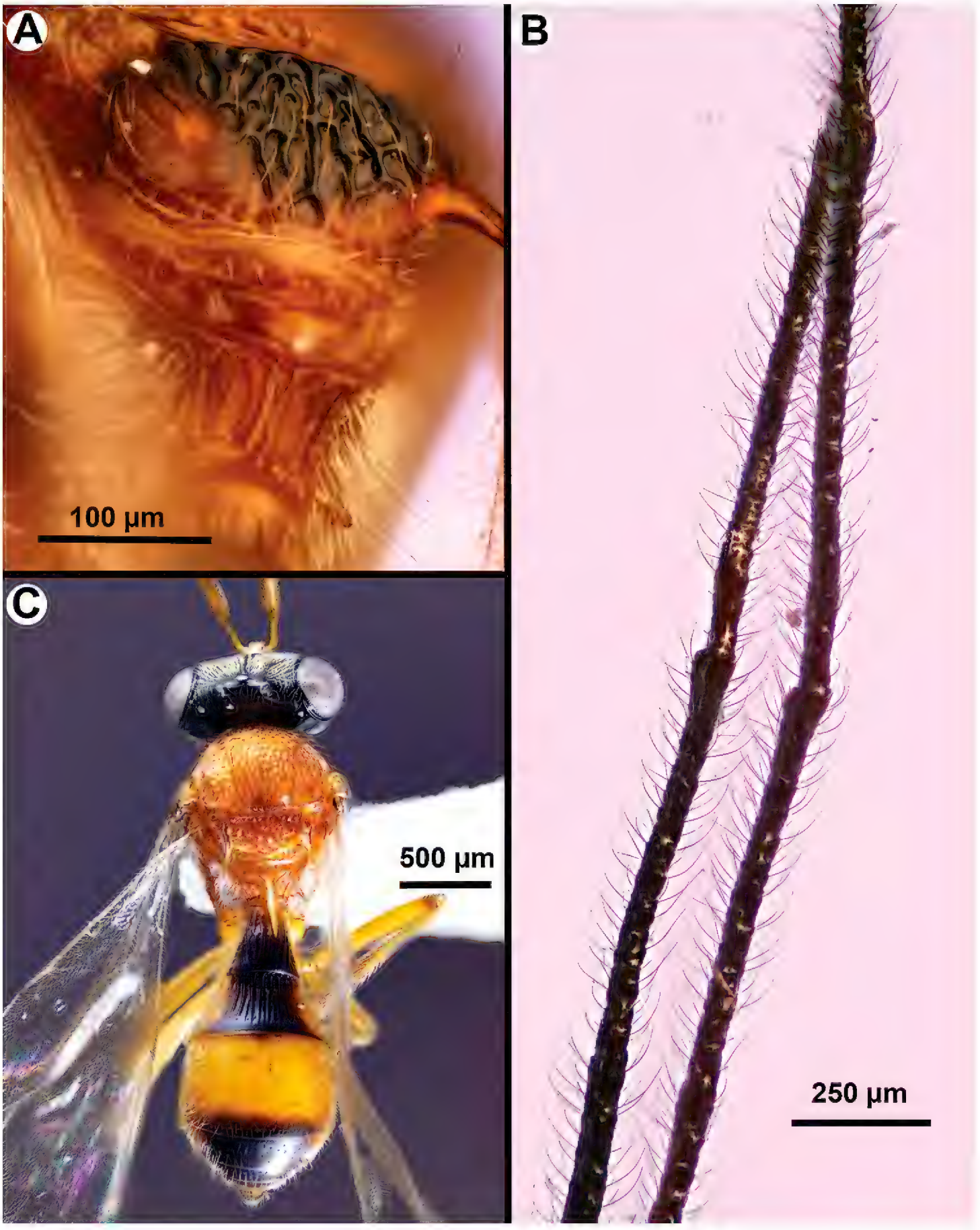

Figure 18. *Gryonoides* sp. **A** *Gryonoides obtusus* Masner & Mikó, sp. nov., mesosoma, posterolateral view (CNCHymen_132942) **B** male antenna of unidentified specimen of the *Gryonoides pulchellus* group (CNCHymen_132878) **C** *Gryonoides pulchellus* Dodd, 1920, female, habitus, dorsal view (CNCHymen_132834).

yellow, mouthparts yellow. Antenna color female: radicle, scape, pedicel, A3, A4, A5, A6, A7 yellowish, A8, A9, A10, A11, A12 brown. Color of mesosoma (female): internotaular area, mesoscutellum , propodeum dorsally of lateral propodeal carina brown, rest of mesosoma orange. Color of metasoma (female): T1, T2 light brown medially, T3 ochre, T4–T6 medial 3/4th brown, laterally ochre. Female radicle length: elongate,

scape 4–4.5 times as long as radicle. Length of setae on male flagellomeres: more than 2 times as long as flagellomere width. Torular triangle and central keel continuity: torular triangle closed dorsally, continuous complete central keel. Torular triangle : present. Torular triangle dorsal limit versus midlevel of upper face: torular triangle extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face : absent. Upper face sculpture: granulous dorsally. Two bare patches equals the width of 2–3 ocelli diameter lateral to dorsal region of torular triangle present. Upper face concavity dorsal view: convex. Central keel : present. Head shape anterior view: head triangular in anterior view (longest head width dorsal to horizontal midline of head). Occipital carina structure dorsomedially: crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: punctate. Notaulus : present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: glabrous. Anteromedial pits of propodeum: present. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 2. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3 : present. T3 posterior 4/5th: sculptured.

Comments. Besides the sculpture of T3, *G. paraguayensis* also differs from *G. pulchellus* var. *pulchellus* in the color pattern of the female antenna and metasoma.

Material. ***Holotype*:** Female, CNCHymen_132932, Pirapo, Paraguay 3.I.-1972 L.E. Pena. ***Paratypes*:** Paraguay - 82 females and 58 males (CNC).

Gryonoides pulchellus Dodd, 1920

Gryonoides pulchricornis Ogloblin, syn.nov
Gryonoides doddi Ogloblin, syn.nov
Gryonoides pulchellus Dodd, 1920: 361 (original description); Masner, 1965: 98 (type information); Johnson, 1992: 513 (cataloged, type information).
Figs 5, 18C, 19

Diagnosis. *Gryonoides pulchellus* is most similar to *G. paraguayensis* (the two species share the glabrous medial area of lateral propodeal area and dorsal metapleural area, and the long posterior propodeal projection (at least 1.5 times as long as wide), and the dorsally closed torular triangle) and differs from this species in the glabrous T3.

Description. *Gryonoides pulchellus* var. *pulchellus*: Body length: 2400–2700 μm. Color of head (female): black, interantennal process yellow, mouthparts yellow. Antenna color female: scape distally, pedicel, A6, A7, A8, A9, A10, A11, A12 brown, A3, A4, A5 yellowish. Color of mesosoma (female): orange; mesoscutellum, hind femur distally brown, rest of mesosoma ochre. Color of metasoma (female): dark brown, only anterior 4/5th of T3 orange. Female radicle length: elongate, scape 4–4.5 times as long as radicle. Torular triangle and central keel continuity: torular triangle

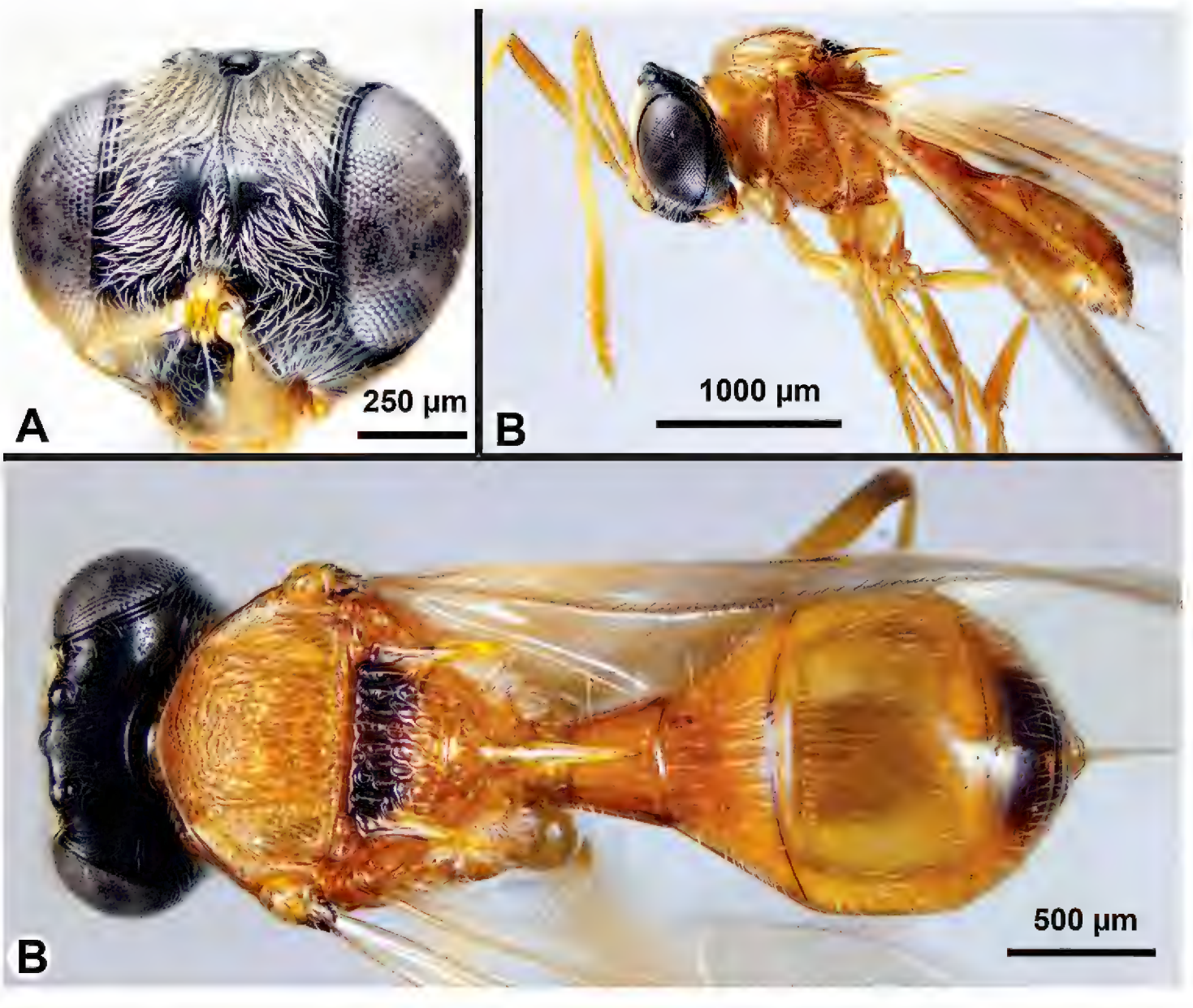

Figure 19. *Gryonoides pulchellus* var. *pulchricornis* Dodd, 1920, female (CNCHymen_132681) **A** habitus, dorsal vies **B** head, anterior view **C** habitus, lateral view.

closed dorsally, continuous complete central keel. Torular triangle : present. Torular triangle dorsal limit versus midlevel of upper face: torular triangle extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face : absent. Upper face sculpture: granulous dorsally. Two bare patches equals the width of 2–3 ocelli diameters present. Upper face concavity dorsal view: convex. Central keel : present. Head shape anterior view: head rounded in anterior view (longest head width in horizontal midline of head). Occipital carina structure dorsomedially: crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: crenulate. Notaulus : present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: glabrous. Anteromedial pits of propodeum: absent. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 2. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3 : absent. T3 posterior $4/5^{th}$: smooth; sculptured. T3 sposterior $4/5^{th}$ of tergite with one or two very weak sulci medially.

Gryonoides pulchellus var. *pulchricornis* (Fig. 28). Body length: 1900–2300 µm. Color of head (female): black, interantennal process yellow, mouthparts yellow. Antenna color female: yellowish, radicle, scape darker then pedicel and flagellum; radicle, scape proximally, A4 distally, A5, A6, A7, A8, A9, A10, A11, A12 yellowish, scape distally, pedicel, A3, A4 proximally brownish. Color of mesosoma (female): mesoscutellum, hind femur distally brown, rest of mesosoma ochre. Color of metasoma (female): ochre, T2, T3 posteriorly, T4, T5, T6, S2, S4, S5, S6 brownish; ochre, T4, T5, T6, S4, S5, S6 brownish.

Gryonoides pulchellus var. *doddi* (Fig. 27). Body length: 2700–2900 µm. Color of head (female): black, interantennal process yellow, mouthparts yellow. Antenna color female: radicle, scape, pedicel, A3, A4, A5, A6, A7 yellowish, A8, A9, A10, A11, A12 brown. Color of mesosoma (female): orange except black mesoscutellum, medially brown mesoscutum and medially brown propodeum; mesoscutellum, hind femur distally brown, rest of mesosoma ochre. Color of metasoma (female): dark brown, only anterior 4/5th of T3 orange; brown, only anterior 4/5th of T3 , T2, T1 and S2, S1 laterally orange.

Material. ***Holotype*** of *G. pulchellus*: B.M. TYPE HYM. 9.335, Teapa,Tabasco, Jan.H.H.S. ; Gudman-SalvinColl.1904-1; (BMNH). Other material of var. *pulchellus*: Costa Rica - 32 females, Ecuador - 1 female, Panama - 3 females, Venezuela - 8 females.

Holotype of *G. doddi*: Argentina: Misiones, Loreto. 18-V-1931. Ogloblin col. Other material of var. *doddi*: Brasil - 4 females, Peru - 2 females. ***Holotype*** of *G. pulchricornis*: Argentina: Misiones, Aristóbulo del Valle. 3-XI-1960. Ogloblin col. Other material of var. *pulchricornis*: Argentina - 1 female, Bolivia - 6 females, Brasil - 2 females, Costa Rica - 1 females, Trinidad - 10 females, Venezuela - 152 females.

Comments. *Gryonoides pulchellus* has three color variations with overlapping geographical distributions (Fig. 26). Perhaps the most distinct color form is var. *pulchellus* with seven black apical flagellomeres (var. *doddi* and var. *pulrchricornis* has the last 5 flagellomeres black or the apical flagellomeres whitish).

Gryonoides rugosus **Masner & Mikó, sp. nov.**
http://zoobank.org/28BA29BC-E014-42B6-BB5A-DB1659363C33
Fig. 20

Diagnosis.*Gryonoides rugosus* is most similar to *G. glabriceps* and *G. mexicali* in having the dorsally closed torular triangle located ventrally of the horizontal midline of the upper face. *Gryonoides rugosus* and *G. mexicali* differs from *G. glabriceps* in having the dorsal metapleural area glabrous, female upper face without transverse patches of dense setation, of anterior propodeal pits and apically straight lateral mesoscutellar spines. *G. rugosus* differs from *G. mexicali* in having punctures of the upper face adjacent to each other, compound eye is 1.5 times as high as long in lateral view, triangular head capsule in anterior view (longest head width dorsal to horizontal midline of head), rugulose T3, of notauli and having anterior propodeal pits not adjacent (distinctly lateral to) anterior end of lateral propodeal carinae.

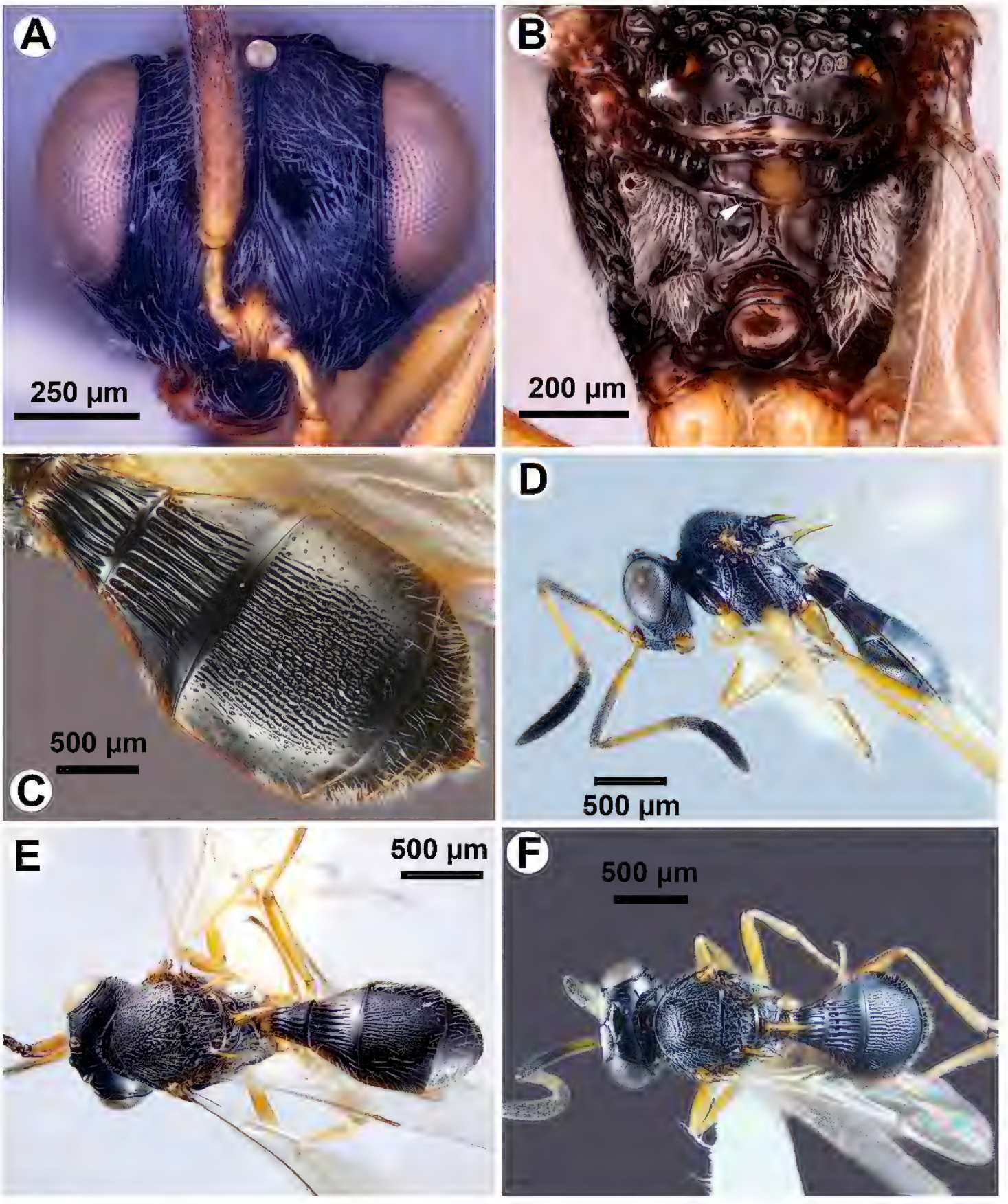

Figure 20. *Gryonoides rugosus* Masner & Mikó, sp. nov. **A** head, anterior view, female **B** mesosoma, posterior view, female (CNCHymen_132851), arrow pointing anterior propodeal pit **C** metasoma, dorsal view, female (CNCHymen_132851) **D** habitus, female, lateral view (CNCHymen_132851) **E** habitus, male, dorsal view (CNCHYmen_132687) **F** habitus, female, dorsal view (CNCHymen_132851).

Description. Body length: 2000–2500 µm. Color of head (female): black, interantennal process yellow, mouthparts yellow. Antenna color female: radicle, A3, A4, A5 yellow, scape, pedicel, A6, A7, A8, A9, A10, A11, A12 brown. Color of mesosoma (female): legs, tegula, lateral mesoscutellar spines, metascutellar spine yellowish, axillae, metanotum, lateral region of pronotal rim reddish, rest of mesosoma black. Color of

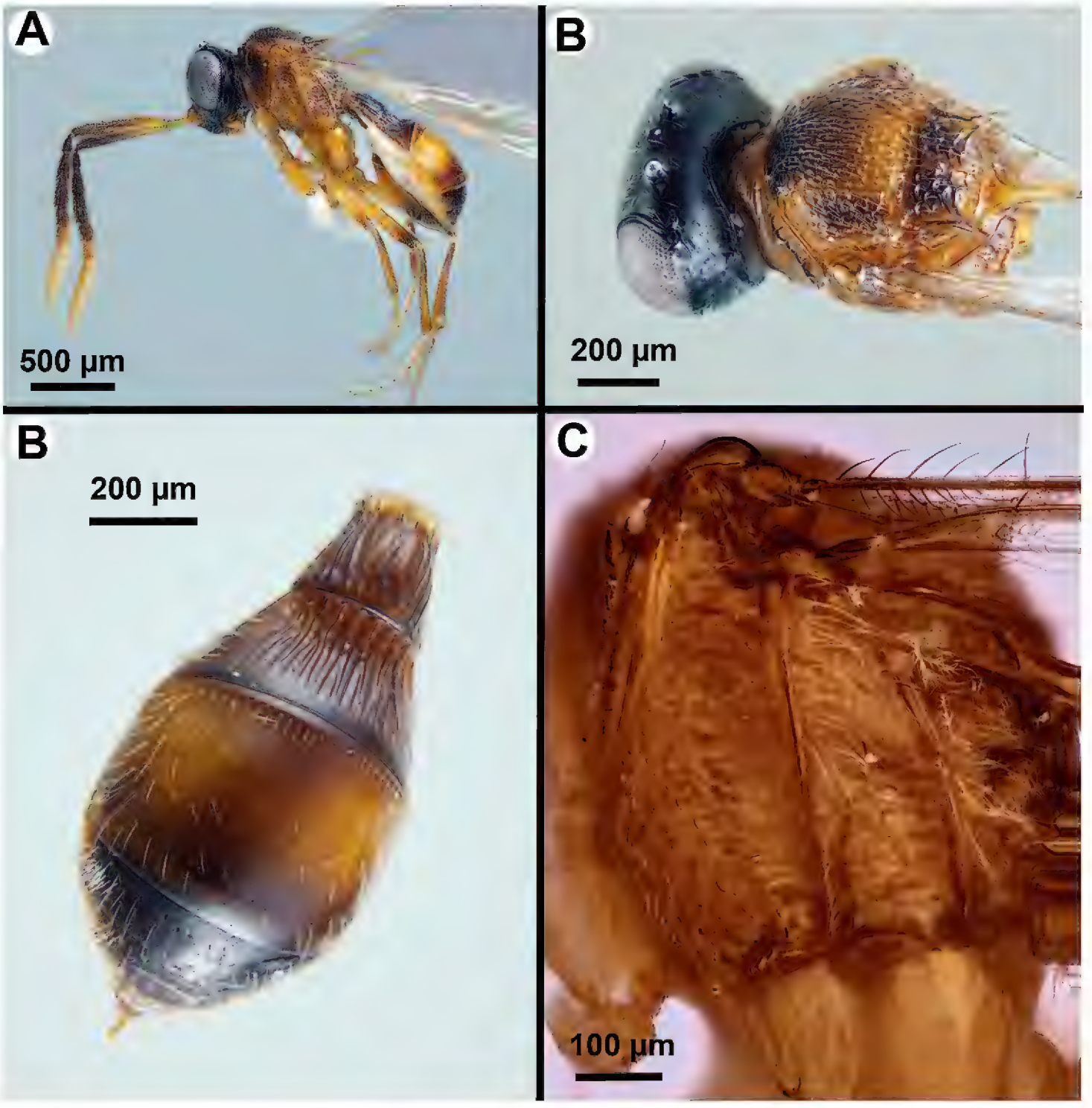

Figure 21. *Gryonoides uruguayensis* Masner & Mikó, sp. nov., female **A** habitus, lateral view (CNCHymen_132841) **B** head and mesosoma, dorsolateral view (CNCHymen_132839) **C** metasoma, dorsal view (CNCHymen_132839) **D** mesosoma, lateral view (CNCHymen_CNCHymen_132840).

metasoma (female): dark brown, laterotergites light brown. Female radicle length: medium, scape 6.5–7 times as long as radicle. Length of setae on male flagellomeres: setae on male flagellomeres shorter than flagellomere width. Torular triangle and central keel continuity: torular triangle closed dorsally, continuous complete central keel. Torular triangle : present. Torular triangle dorsal limit versus midlevel of upper face: torular triangle not extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face : absent. Upper face sculpture: granulous dorsally. Two bare patches with diameter distinctly larger than 2–3 ocelli diameters present. Upper face concavity dorsal view: concave. Central keel : present. Head shape anterior view: head triangular in anterior view (longest head width dorsal to horizontal midline of head). Occipital carina structure dorsomedially: crenulate. Facial striae dorsal end: extending

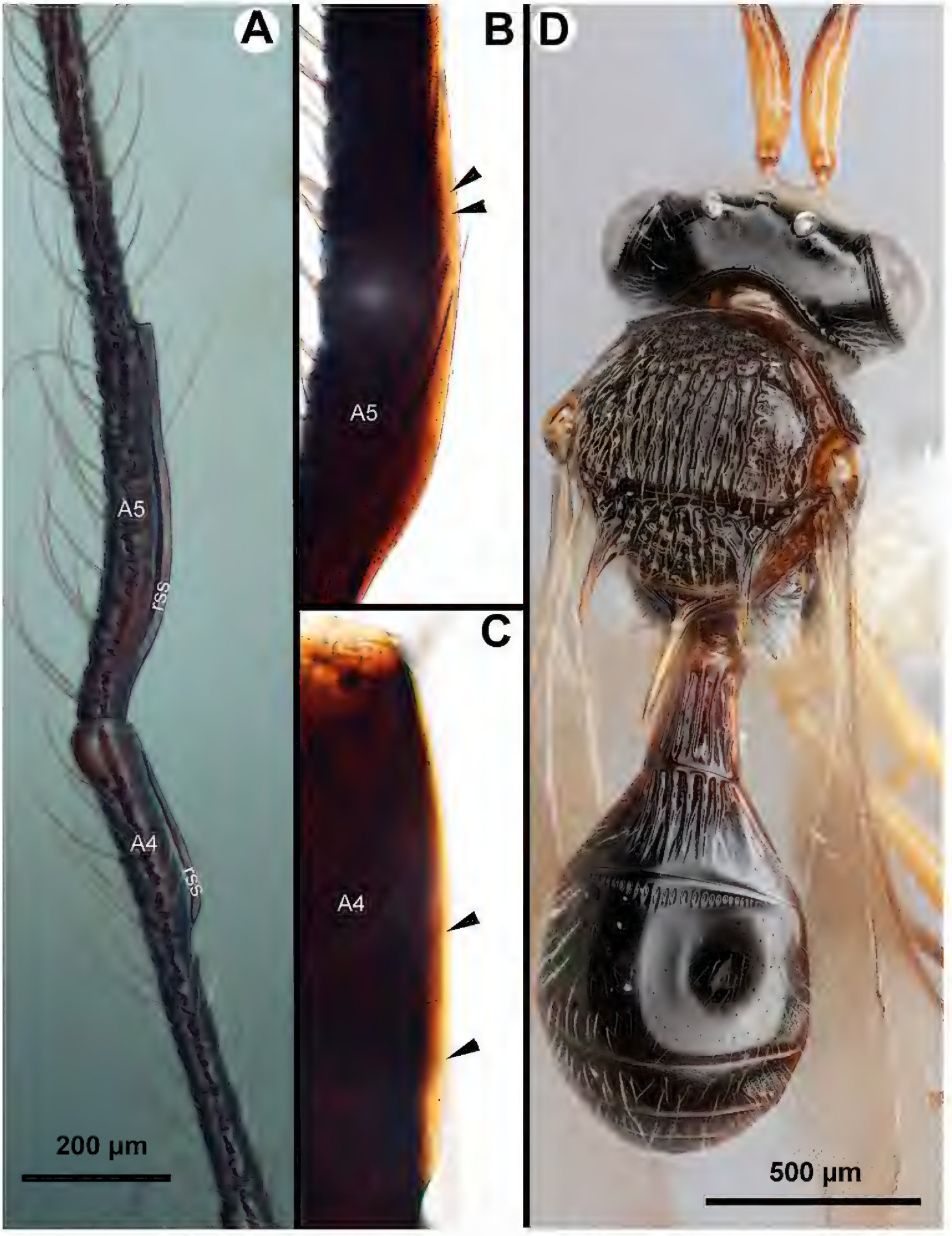

Figure 22. *Gryonoides mirabilicornis* Masner & Mikó, sp. nov. **A** A4 and A5 showing elongate release and spread structures (rss) **B** release and spread structures (tyloids) correspond to class 3 gland cells (Noirot and Quennedey 1976) and are characterised by the presence of cuticular canals (arrows). Release and spread structures are present only on the fifth flagellomere in most Platygastroidea (except *Sparasionini*).

dorsally of midlevel of eye. Vertex sculpture: smooth. Notaulus : present. Dorsal metapleural area: with setae. Anteromedial pits of propodeum: present. Anteromedial pits of the propodeum versus lateral propodeal carina: pits lateral to anterior end of lateral

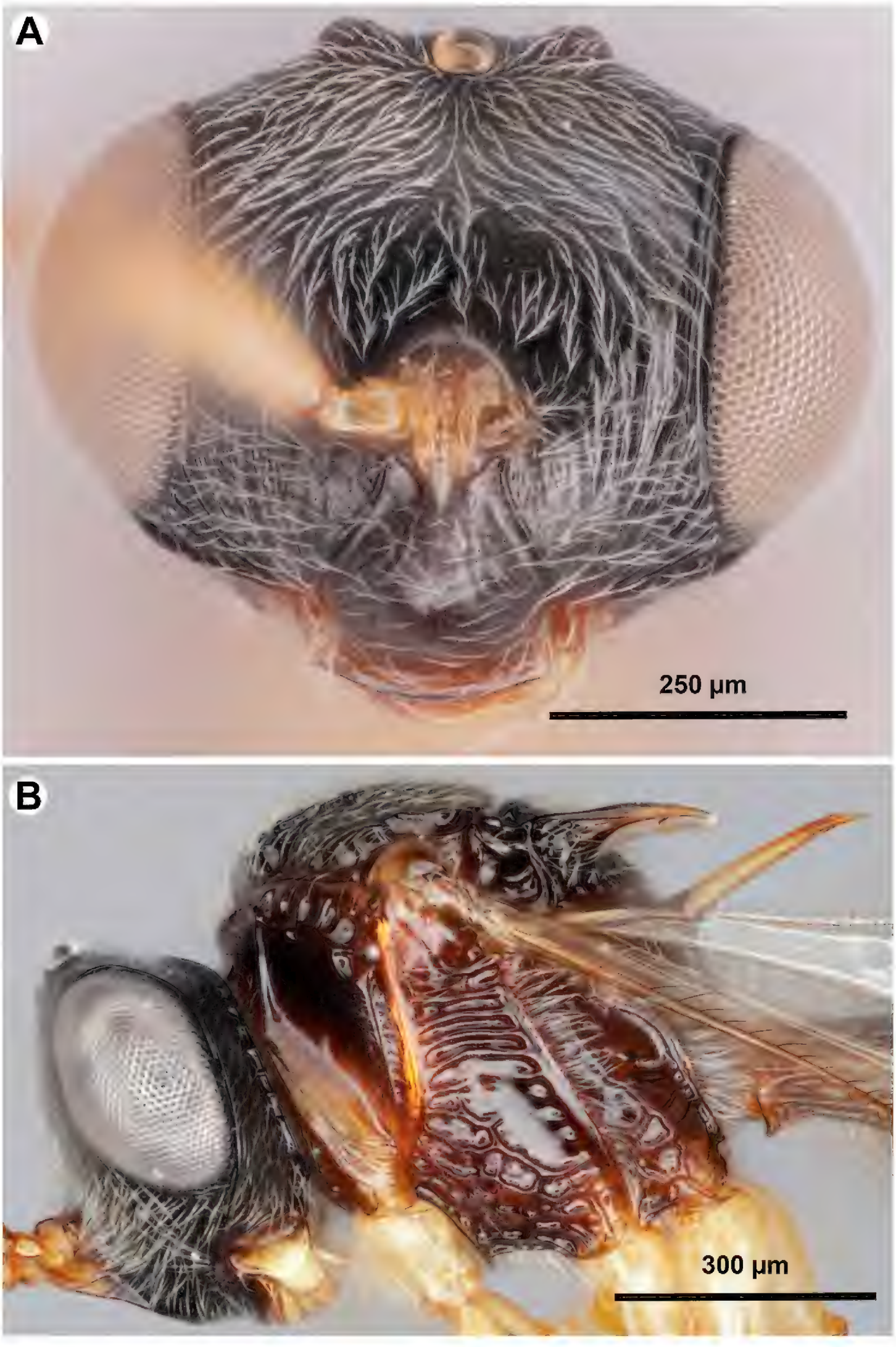

Figure 23. *Gryonoides mirabilicornis* Masner & Mikó, sp. nov. **A** head, anterior view **B** head and mesosoma, lateral view.

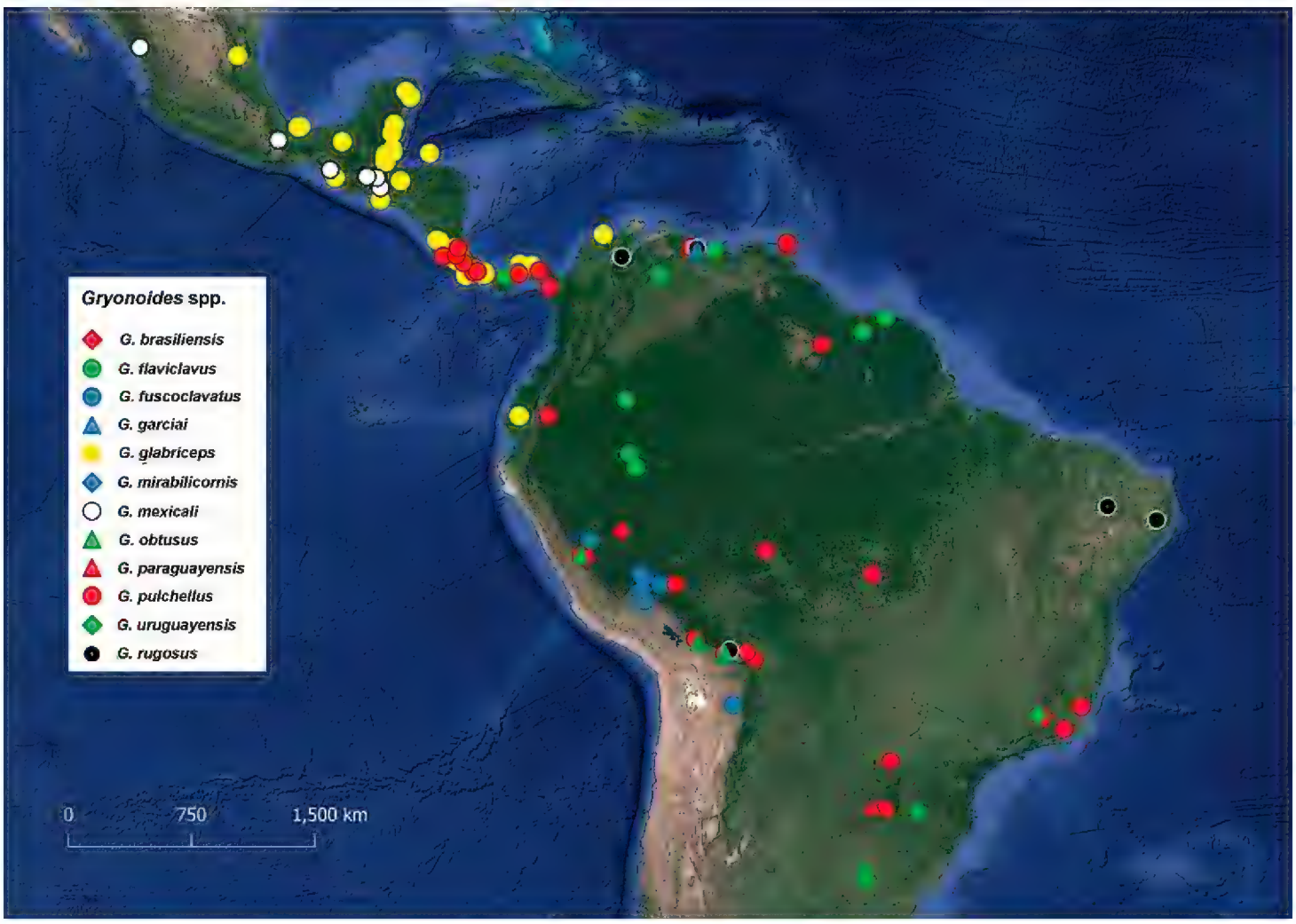

Figure 24. Distribution of *Gryonoides* species.

propodeal carinae. Area between plica and lateral propodeal carina sculpture: carinate (1 or 2 carinae present). Number of longitudinal carinae between plica and longitudinal (dorsal) section of lateral propodeal carina: 1. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3 : present. T3 posterior 4/5th: sculptured.

Material. ***Holotype*:** Female, CNCHymen_132847, Venezuela, Zuila El Tucuco, 200m primary rain for. 23.IV.81 L.Masner (CNC). ***Paratypes*:** Bolivia - 1 female (CNC), Brazil - 2 females and 2 males (CNC), Venezuela - 1 female and 4 males (CNC).

***Gryonoides uruguayensis* Masner & Mikó, sp. nov.**
http://zoobank.org/560EA5AC-D158-4298-928E-14E0ADA2BFBF
Fig. 21

Diagnosis. *Gryonoides uruguayensis* shares the setous dorsal metapleural area with *G. garciai* and differs from that species in having the medial part of the lateral propodeal area glabrous (setose in *G. garciai*). Besides the setose dorsal metapleural area, *Gryonoides uruguayensis* differs from all other members of the *Gryonoides pulchellus* group in the areolate-rugose lateral propodeal area and the coloration of the female antenna (scape in distal 2/3rd, pedicel, A3–A6 dark brown; clava yellow).

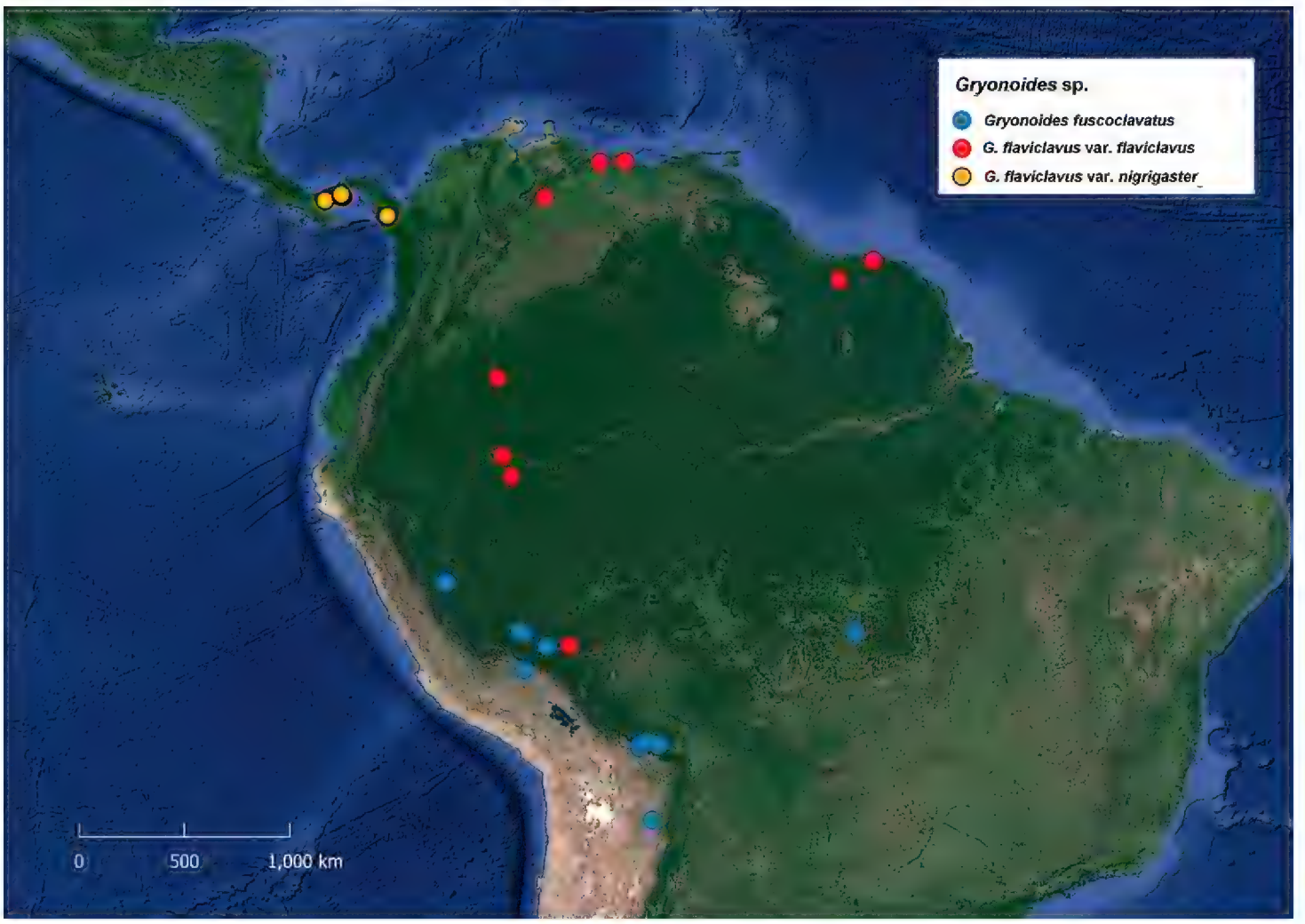

Figure 25. Distribution of *Gryonoides fuscoclavatus* Masner & Mikó, sp. nov. and *Gryonoides flaviclavatus* Masner & Mikó, sp. nov.

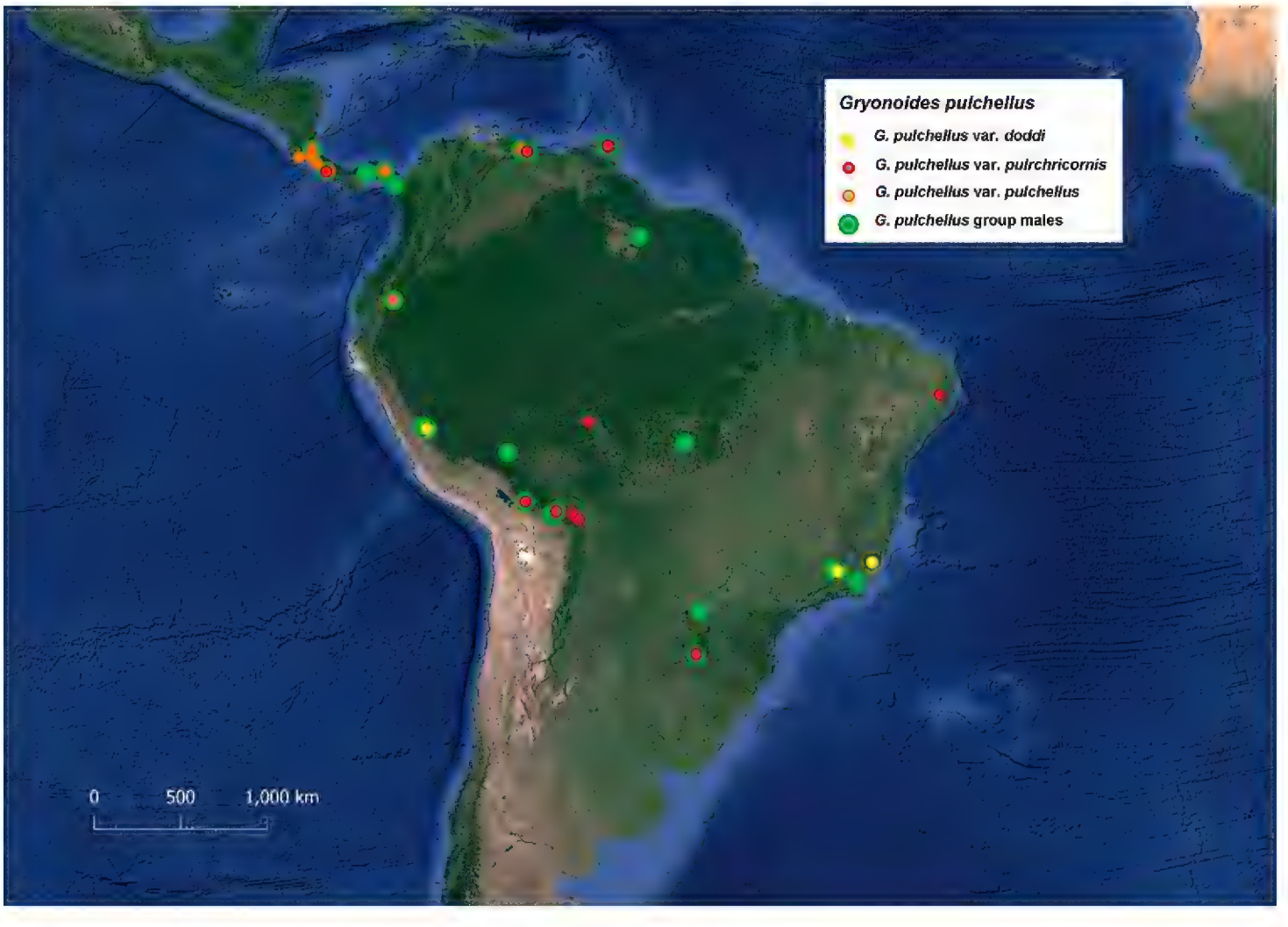

Figure 26. Distribution of *Gryonoides pulchellus* Dodd, 1920.

Figure 27. Holotype specimen of *Gryonoides doddi* Ogloblin, 1967.

Description. Body length: 2600–3100 μm. Color of head (female): black, interantennal process yellow, mouthparts yellow. Antenna color female: radicle, scape proximally, A7, A8, A9, A10, A11, A12 yellow, scape distally, pedicel, A3, A4, A5, A6 brown. Color of mesosoma (female): ochre except mesoscutellum laterally, medial mesoscutal area and lateral mesoscutal areas medially brown. Color of metasoma (female): dark brown, only anterior 4/5th of T3 orange; ochre, T4, T5, T6, S4, S5, S6 brownish. Female radicle length: elongate, scape 4–4.5 times as long as radicle. Torular triangle and central keel continuity: torular triangle closed dorsally, continuous complete central keel. Torular triangle : present. Torular triangle dorsal limit versus midlevel of upper face: torular triangle extending to horizontal (transverse) midline of upper face. Transverse setal fields on upper face : absent. Upper face sculpture: granulous dorsally. Two bare patches equals the width of 2–3 ocelli diameter lateral to dorsal region of torular trinagle present. Upper face concavity dorsal view: convex. Central keel : present. Head shape anterior

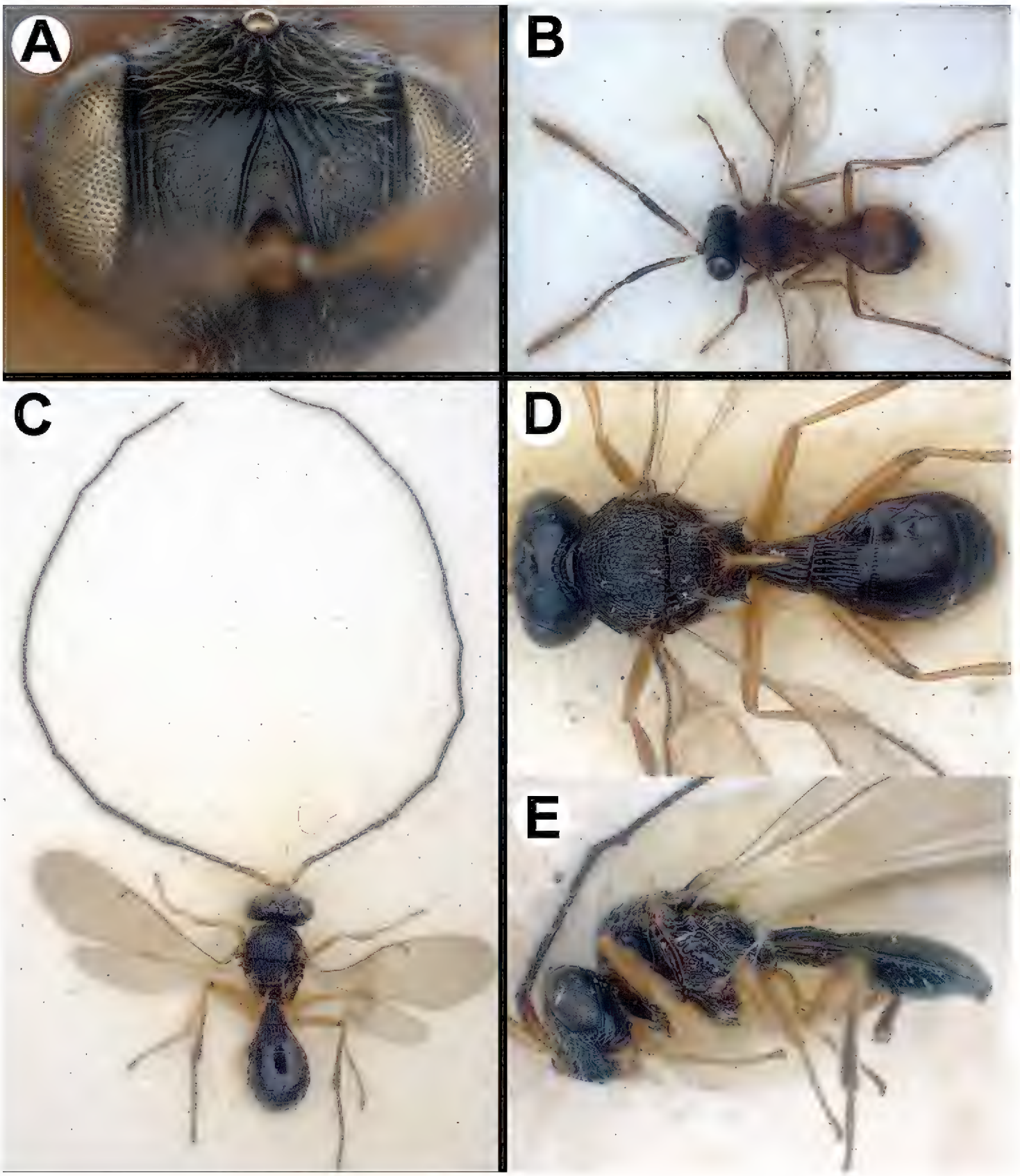

Figure 28. Paratypes of *Gryonoides pulchricornis* Ogloblin, 1967.

view: head rounded in anterior view (longest head width in horizontal midline of head). Occipital carina structure dorsomedially: crenulate. Facial striae dorsal end: not reaching midlevel of eye. Vertex sculpture: smooth. Notaulus : present. Notaulus anterior end: anterior to the transscutal line. Dorsal metapleural area: with setae. Anteromedial pits of propodeum: absent. Area between plica and lateral propodeal carina sculpture: areolate. Medial region of lateral propodeal area pilosity: glabrous. Posterior propodeal projection length: more than two times as long as wide. Rugulose sculpture on T3 : present. T3 posterior 4/5th: smooth.

Material. ***Holotype*****:** *Female*, CNCHymen_132837 Uruguay: Tacuarembo Estancia Don Horacio 11–26.XII.2002, 311m 31°15'36"S 56°03'30"W valley thicket S. & J Peck, FIT (CNC). ***Paratypes*****:** Brazil - 2 females (CNC), Uruguay - 3 females and 1 male (CNC).

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Supplementary material 1

Appendix 1
Authors: István Mikó, Katja C. Seltmann
Data type: Occurrences.
Explanation note: Ocurrences table of the DWC file for Mikó et al. Review of *Gryonoides*.

Link: https://doi.org/10.3897/jhr.87.72931.suppl1

Supplementary material 2

Phenoscript statements
Authors: István Mikó, Julia Hobbie, Sergei Tarasov
Data type: Morphological.
Explanation note: Phenoscript statements for generic and species descriptions of Mikó et al. Review of *Gryonoides*.

Link: https://doi.org/10.3897/jhr.87.72931.suppl2

Supplementary material 3

Merged ontology used in phenoscripts
Authors: István Mikó, Julia Hobbie, Sergei Tarasov
Data type: Morphology.
Explanation note: Merged ontologies used in the generation of phenoscripts for Mikó et al. Review of *Gryonoides*.

Link: https://doi.org/10.3897/jhr.87.72931.suppl3